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ABSTRACT

A bilingual, bicultural program in the Edgewood Independent School District in San Antonio, Texas, part of the Experimental Schools Program, was designed to reverse "negative self concept, motivation, and attitudes" of its Mexican American students, and by so doing, improve their academic achievement. Efforts were employed to: (1) acquire more Mexican American teachers; (2) use Spanish as a language of instruction and classroom management; (3) develop/adapt Mexican American and local content materials; and (4) increase individualized instruction. Evaluation of the program was conducted during a four-year period, and included both cross sectional analyses within each of the years and longitudinal analyses across the four for experimental and comparison students. No major differences were revealed between the groups at the beginning of the testing period. Mexican American students were found to be at or above the norm in self concept and attitudes, somewhat below the norm in motivation for some years in which they were measured, and below the norm in achievement every year. Few significant effects of the program in improving the students' affect and their had not been efficacious in promoting either the psychosocial had not been efficacious in promoting either the psychosicial or cognitive growth of the students. (Author/JD)

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Psychosocial Growth and Academic Achievement in Mexican American Students

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Submitted to:

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* * * * *

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ABSTRACT

The Edgewood School Plan, a National Institute of Education experimental schools project in the Edgewood Independent School District, San Antonio, Texas, developed a rationale for its program that sought to right what it saw as the "incompatibilities between the predominantly Mexican American student body and a middle class, Anglo Saxon system." It specifically attempted to reverse "negative self concept, motivation, and attitudes," and by so doing, improve the academic achievement of the students.

The program acquired more Mexican American teachers, used Spanish as a language of instruction and classroom management, developed and/or adapted materials with Mexican American and local content, increased small group and individualized instruction. Although considerable variation was present in each of these educational elements during four years of federal funding, the original goals were reaffirmed in their continuation documents.

Development Associates conducted the external, summative evaluation of the project, and carried out on site observations, measured each of the affective and cognitive variables, and studied the curricula and their implementation during the first four years of the operation. The present research represents the aggregation of the affective and cognitive studies across these four years, in order to provide evidence on the premises of the plan and how well it accomplished its goals during the period.

The research design included both cross sectional analyses within each of the years and longitudinal analyses across the four. Students were tracked across years as cohort groups: Cohort I began with first grade and progressed to fourth; Cohort II was initiated with fifth and continued through seventh; Cohort III covered eighth through tenth. The last years in the latter cohort groups suffered considerably from attrition. Both experimental and comparison students were studied simultaneously. The affective domain was measured via the Self-Concept and Motivation Inventory and the Student Behavior Description Questionnaire; achievement was tested with the TOBE-CTBS/Q series.

No major differences were found between the treatment and comparison groups at the beginning of the four year period. Research question one examined the district premise that their youngsters were low or negative in affect. Examination of self concept and attitudes found these Mexican American students at or above the norm for the instruments. They were somewhat below the norm in motivation for some of the years in which

they were measured. Achievement was below the norm every year.

Research question two probed the efficacy of the treatment program in improving the affect of the students and thereby raising their achievement scores. The data from all students completing the affective and cognitive instruments in any one year were analyzed cross sectionally; those students present across the tracked period, the longitudinal subsample, were studied cross sectionally and via repeated measures analysis. Blocking for grade, sex, and group (treatment and comparison), the affective variables (self concept, motivation, and achievement, affiliation, and inclusion attitude) and the cognitive variables (reading, language, arithmetic, total achievement, and study skills) were analyzed where applicable.

Few significant effects were found. Those that did occur tended to be cognitive rather than affective, and most of the differences were between males and females with the latter scoring higher. At grade 4 in Cohort I, the comparison students scored higher in achievement than the treatment students. Fewer differences were found with the longitudinal than with the cross sectional samples. When the cohort groups were studied across time via the repeated measures analyses, no affective differences remained, that is to say, the differences had been short run and had not persisted across the life of the project. One cognitive difference continued: the comparison scored higher in language than the treatment in Cohort I. In summary, the authors concluded that the treatment program had not been efficacious in promoting either the psychosocial or cognitive growth of the students.

Because of the treatment program's proposition that improvement in affect would concomitantly raise achievement, research question three examined the influence of the affective variables on cognitive performance. Utilizing multiple regression analyses with stepwise inclusion and canonical correlation analyses, the amount of variance in achievement explained by the affective variables and sex was determined by grade and sex for the longitudinal subsamples. The few sporadic and inconsistent findings, perhaps due to chance, led the authors to conclude that the effect of affect on the achievement of these Mexican American children was negligible. Sex differences were likewise unimportant in these analyses; grade did not produce significant differences.

The conclusions for practitioners included:

1. In general, the assumption that Mexican American students' affect is low or negative was not upheld; these students were near or at the instruments' norms.
2. There was little or no relationship between the affective and cognitive scores of these students.

3. A large individualized instruction program appeared to have produced a relative decrease in the treatment students' achievement scores when compared to those in a more traditional program at grade 4.
4. Females scored higher than males on a number of variables between third and sixth grades; there were few differences before or after this period.
5. Basing an instructional program on the theory of incompatibilities, at least as translated into action by this experimental program, did not produce improved achievement scores.

Overall, the treatment program of the Edgewood School Plan did not improve the life chances of its Mexican American students through increases in either the affective or cognitive domain scores when these were compared to those of students in similar schools who did not participate in the experimental program.

Attention was directed to three areas of research meriting further study:

1. Why females scored quite consistently higher than males during the later elementary grades.
2. What variables, such as classroom cognitive climate, for example, account for differentials in achievement.
3. Why these Mexican American students apparently achieved more in the more traditional instructional approach than in individualized instruction, at least over the short run in fourth grade.

Answers to these problematic areas should greatly assist schools in designing and carrying out programs of instruction that would measurably increase academic achievement and psychosocial growth.

THEORETICAL BACKGROUND OF THE STUDY

Differential school achievement among ethnic groups is a cause for serious concern because school performance has become the chief avenue for upward social mobility in American society. When, with few individual exceptions, an entire group of people distinguished by common socio-economic or ethnic traits consistently achieves below other groups characterized differently on these traits, it means that the group's life chances are being systematically depressed. That such a situation prevails for the Mexican American has been extensively documented. Locating the cause of this underachievement is more difficult.

Early studies of this phenomenon delineated and correlated characteristics of the Mexican American culture which were thought to have adverse effects on achievement. Many recent studies have rejected such approaches, however, and have ascribed the failure to the educational institution's general inability to adapt programs to the distinctive needs and characteristics of Mexican Americans or to inadequate educational programs and facilities resulting from the Mexican Americans' marginal socioeconomic position.

The present research measured the impact of a large scale bilingual bicultural program, following the trend of these later studies and designed on the premise that appropriate changes in the educational institution would facilitate increased, competitive achievement among the Mexican American students participating in it. The specific program investigated was the Edgewood School Plan (ESP) of the Edgewood Independent School District (EISD) in San Antonio, Texas, an educational change program with five year longitudinal federal funding by the National Institute of Education (NIE). This plan proposed to alter various educational processes to create "compatibility" between the educational institution and Mexican American students' characteristics and needs. In particular, ESP proposed to develop an educational program which would promote the psychosocial growth of Mexican American students, including the improvement of their self concept, motivation, and school attitudes, and thereby increase their school achievement. (30)

The Edgewood School Plan attempted to reduce the differences it saw as incompatible to the largely Mexican American student body by acquiring more Mexican American teachers and administrators and by encouraging the use of Spanish in both the instruction and in the class management. Further, it proposed to add Mexican American and local San Antonio topics into the curricula in order to provide self identification materials to heighten the interest of the students. A wide

variety of curricular designs and content were adopted, adapted, or written to improve the cognitive and affective progress of the pupils. While these were not provided in a uniform pattern through the five years of the project, there was a definite move toward individualized and small group instructional techniques in most of them. Despite the changes made during the life of the project, the goals of the instruction remained essentially the same: improve the affective climate and instructional methodologies in order to obtain increased academic achievement. (12)

The external evaluation of the project was contracted by the National Institute of Education with a private company, Development Associates, which set up a San Antonio office to collect and analyze the data for the summative study. Utilizing the goals and objectives stated in the ESP Final Plan (30), and modifying the instrumentation to adapt to programmatic changes over the four years, the researchers monitored the processes of project planning, management, and implementation, as well as measuring the affective variables of self concept, motivation, and attitudes, and the academic achievement of the pupils in the project's target grades. The results were analyzed each year and then over the four year period.

The study is important, not simply because it evaluates a particular educational program, but because much of the existing literature has suggested that self concept, motivation, and attitudes are important variables inherent to the educational processes of children in general and Mexican Americans in particular. Indeed, the assumptions held by many educational practitioners and those in EISD are:

1. the affective variables of school self concept, motivation, and attitudes of Mexican American students are low as compared to other White and minority group students;
2. there are high, direct correlations among self concept, motivation, attitude, and achievement; and
3. that an increase in positive self concept, motivation, and attitude, presumably produced in this case as a program impact, would result in concomitant increases in achievement.

While considerable theoretical attention has been given to these variables, there is a paucity of empirical studies researching the relationship between affective and cognitive variables for Mexican Americans. The present study was expected to provide new and timely data regarding these issues.

Academic Achievement of Mexican Americans

There is considerable evidence documenting the low educational achievement of Mexican American students. The first major empirical account of the educational status of Mexican Americans was that by Coleman et al (16), Equality of Educational Opportunity, published in 1966. Although this study primarily focused on ascertaining the extent of educational segregation and levels of educational opportunity of Blacks, data were compiled on other minority groups, including Mexican Americans. The study concluded that educational achievement of Mexican Americans was below that of other White and Black students but above that of Puerto Ricans and American Indians. The most pronounced deficiencies noted were in math, reading comprehension, and verbal ability. By the twelfth grade, Mexican Americans as a group scored 4.1 years below the national norm in math achievement, 3.5 years in verbal ability, and 3.3 years in reading.

The most extensive study on Mexican Americans was that conducted by Grebler, Moore & Guzman (39) who investigated economic, social, political, and educational characteristics of the Mexican American community. The authors noted that the median education level ranged in the mid 1960s from a low of 4.8 years in Texas to a high of 8.6 in California, as compared to 11.5 and 12.2 for Anglos. Reading and verbal skills were the areas of most serious deficiency.

In an investigation of the trend of educational status of Mexican Americans in Texas between 1950 and 1960, Lamana & Samora (49) concluded that the median level of education had increased from 3.6 to 4.8 years but the median was still 1.2 years below that of the total population; the educational status of Mexican Americans in Texas was the lowest in the Southwest; that "better" educated Mexican Americans were becoming geographically segregated from the less educated; and that the educational status of Mexican Americans relative to other groups in Texas was unchanged from 1950 to 1960.

The most recent reports documenting the educational status of Mexican Americans was a series produced by the United States Commission on Civil Rights. Although it suffered from some methodological weaknesses, the major contribution of this series was a greater understanding of some of the causes of low educational attainment. The commission's report, The Unfinished Education (79), concluded that Mexican American students generally achieved at a lower rate than other White students, school holding power was lower, reading achievement was poorer, grade repetition was more frequent, overageness more prevalent, and participation in extra curricular activities less than their Anglo counterparts. The report estimated that out of every 100 Mexican American pupils who enter first grade, only about 60 graduate from high school.

Of the Mexican American students in the Southwest, between the 8th and 12th grades, 40% was reading two or more years below grade level. Another report, The Excluded Student (80), concluded that the low educational achievement was in part attributed to the tendency of schools to ignore the language, culture, and heritage of students; the over-representation of Mexican Americans in low ability groups and educable mentally retarded class; and, the under-representation of Mexican Americans in school staffing. The report on Mexican American Education in Texas: A Function of Wealth (81) examined the manner in which the Texas school finance system discriminated against schools with high proportions of low income groups, including Mexican Americans.

Much of the contemporary literature is particularly critical of the sociocultural assumptions often cited as the cause of low achievement and overt discriminatory practices. In their investigation of sociocultural determinants of achievement among 263 Mexican American children, Anderson & Anderson (1) found that these children desired good grades and received as much encouragement at home as Anglo children. The authors further concluded that the consistently low achievement of Mexican Americans was due to inadequate educational programs and not to low educational motivation. Carter (9) also cited the lack of adequate provisions in school programs to meet the needs of Mexican American students as accounting for low achievement. He further concluded that the stereotypic notion of "cultural deprivation" was primarily a rationalization to excuse the weak development of positive educational programs.

In a lucid discussion of the educational problems facing Mexican Americans, Ortego (62) also charged that inadequate school programs and continued use of socially and educationally discriminatory practices were at fault for their low educational achievement. Similarly, Mayeske (53) concluded that about 20% of the difference in educational achievement among Mexican Americans was attributable to the kinds of schools they attended.

Other recent research studies have challenged the earlier contention that Mexican Americans were to blame for their low educational achievement. Reports by Lorea & Kohut (51), Mycue (60), Del Buono (26), and Broussard (6), which controlled for linguistic, socioeconomic, and cultural variations, concluded that Mexican Americans were not atypical of other non-White students. Their findings were supported in a recent study by Cervantes & Jones (12).

Based on the review of a decade of research, Darcy (23) concluded that bilingual children were not inferior to monolinguals when nonverbal tests were used and socioeconomic status was controlled. Similarly, Gezi (37), on the basis

of his review of research on bilingual bicultural education, found that bilinguals had an IQ as high as monolinguals. Bernal (4), on the other hand, using controls for grade level, socioeconomic status, and bilingualism, found that there was a significant difference in scores between Mexican American students and Anglos on tests designed to measure higher-order intellectual operations (problem solving and concept attainment), but that when appropriate experiential intervention strategies were introduced, the difference disappeared. Other studies which investigated Spanish language instructional methodologies and controlled for socioeconomic status have suggested that Mexican Americans can attain achievement scores as high as other White students.

What is underscored by this review of the literature on the school achievement of Mexican Americans is:

1. that as a group, Mexican Americans achieve considerably below the level of other Whites and some other minority groups; and
2. that recent studies attribute this underachievement not to atypical characteristics of Mexican Americans nor to any innate inability on their part to achieve, but to discriminatory educational practices resulting from their marginal socioeconomic status or the failure of schools to adapt programs to the unique characteristics and needs of Mexican Americans.

The question that remains is how best to attack the problem of enhancing Mexican American achievement.*

Academic Self Concept

During the past two decades, research regarding self concept has produced a divergent body of literature ranging from the definitions of this theoretical construct (19, 36, 42, 50, 57, 69, 85), to the examination of its formulation (61), and stability (33, 48, 78), to its application across sex differences (33, 55, 56, 73, 76), and socioeconomic status (6, 41, 45).

More recent research, however, has focused on the cognitive motivational system, believed to explain and predict a

*The authors do not intend to imply that the students in every predominantly Mexican American school are achieving below norm. The San Diego, Texas, pupils, for example, scored at or near the norm in 1976 (unpublished analyses).

variety of behaviors (84). Campbell (8) and Reeder (68) summarized a number of methods and studies that related self concept to academic achievement. The findings supported a low, positive relationship between these two factors. Coopersmith (18) and Walsh (82) also supported the relationship of self concept to school achievement. Campbell (8), Purkey (64), Williams & Cole (84), and Zirkel (88) found significant positive correlations between self concept and measures of school adjustment.

A number of studies, on the other hand, found that self concept was not a reliable predictor of achievement. Deese (25) and Spears & Deese (77) summarized extensive reviews on self concept by a number of authors and found that it was not a reliable predictor of achievement. They also pointed out the difficulty in validating self concept theory because of the inadequate logical analysis of the concept and the incomplete and/or inappropriate translation of the construct into methodology. In many studies, methodology was determinted by the nature of the self concept theory as defined by the researcher. The problem was that each investigator had his own notion of what constituted self concept and, therefore, devised his own method for its measurement.

Despite limitations of instrumentation and somewhat inconsistent conclusions, many educators and others continue to regard self concept as a critically important variable related to education. The self concept of Mexican Americans, in particular, has received increasing research attention in recent years. Coleman et al (16) found the self concept of Mexican American children to be significantly lower than that of other White children, while DeBlassie & Healy (24) and Carter (9) found no significant differences. Evans & Anderson (34) found no difference between male and female Mexican American students in self concept of ability. Two recent studies on the self concept of Mexican Americans showed that middle and high school students' self concept was mostly at the national norm and the greatest fluctuations occurred at the elementary level (12, 13). The reasons for the inconsistencies of findings are varied. Some may have been due to differences in definitions, instruments, research designs, age groups, regions, times, and subjects.

It is clear, however, that the precise relationship between self concept and achievement has not been established. Contradictory findings with respect to the self concept of Mexican Americans and their achievement warrant the additional research provided by this study.

Achievement Motivation

Achievement motivation was defined by McClelland et al (54) and Atkinson (2) as a desire to compete with a standard of excellence. Initial investigations with a thematic apperception instrument indicated that achievement orientation showed low, but statistically significant, correlations with task behaviors such as performance on a scrambled words and anagrams test, SAT scores, and college grades and that there was an interaction effect between achievement motivation (nAch) and conditions of arousal such that persons who scored high and low on nAch, performed better under differing conditions of arousal. Later studies reported in Atkinson (2) supported the findings that level of performance was the result of a complex interaction between nAch, conditions of arousal, goal expectancy, and value of incentive.

While a number of problems with measurement and conceptualization have plagued studies on achievement motivation (15, 29, 41, 67, 74, 83), a number of interesting hypotheses with implications for educational programs have been raised with respect to differences in mean nAch scores between social groups. McClelland et al (54, p. 275) argued that:

> All motives are learned...they develop out of repeated affective experiences connected with certain types of behavior. In the case of achievement motivation, the situations should involve 'standards of excellence,' presumably imposed on the child by culture, or more particularly by the parents as representatives of the culture, and the behavior should involve either 'competition' with those standards of excellence or attempts to meet them which, if successful, produce positive affect or, if unsuccessful, negative affect. It follows that those cultures or families which stress 'competition with standards of excellence,' or which insist <u>that the child be able to perform certain tasks well by himself</u> -- such cultures or familes should produce children with high achievement motivation.

The initial McClelland et al (54) investigations lent support to the quoted hypothesis. A series of later studies presented in Atkinson (2) gave further support to this hypothesis, highlighting, in particular, that strength in achievement motivation varied according to social class background, and was related to the varying socialization techniques employed by persons of the lower as compared to the middle class.

In a study salient because of the predominantly marginal status of Mexican Americans, Rosen (70) developed the concept of the "achievement syndrome" which included both nAch and achievement value orientations and which, he argued, provided

a psychocultural explanation for differences in social mobility and stratification. Rosen considered achievement value orientations especially important in this concept because (70, p. 500):

> Achievement-oriented situations and goals are not defined by the achievement motive; it may provide the impetus to excel, but it does not delineate the areas in which such excellence should or may take place. Achievement motivation can be expressed through a wide range of behavior, some of which may not be conducive to social mobility in our society...Whether the individual will elect to strive for success in situations which facilitate mobility in our society will, in part, be determined by his values.

Values which included an activistic, future oriented, individualistic point of view were considered those reflective of values most likely to promote achievement and social mobility.

Rosen found that there was a significant difference in academic achievement between lower and middle class children, but that when achievement motivation was introduced as a control variable, these differences disappeared. Within strata, however, there were significant differences in academic achievement as measured by school grades between those with high and low achievement motivation. This finding confirmed the relationship between academic achievement and achievement motivation and that high achievement motivation is disproportionately present among members of the middle class.

While value orientation was not related to academic achievement, it was related to another variable, extremely important for social mobility, namely, level of educational aspiration. The study indicated also that there are a disproportionate number of under aspirers among the lower class and a disproportionate number of over aspirers among the middle class. The author attributed this to the unique middle class style of socialization, which gave them an advantage over members of the lower class in social mobility.

Building on Rosen's notion of the achievement syndrome, Evans & Anderson (34) conducted a study of the psychocultural origins of achievement and achievement motivation among Mexican American students in New Mexico. These researchers found no significant differences in achievement motivation between Anglo American and Mexican American students, but did find that Mexican American students scored significantly lower on the educational aspiration scale than their Anglo counterparts.

In addition, while there was no significant difference in the amount of achievement training provided in the home between

Anglo American and Mexican American families, there was a significant difference in the amount of independence training which Mexican American mothers provided to their children in comparison to their Anglo counterparts. The latter is especially important because there was a high correlation between the amount of independence training which a Mexican American student received and his/her level of achievement. Furthermore, those Mexican American students who evidenced activistic, future time orientation scored significantly better on achievement tests than those who did not, but these orientations occurred with greater frequency among Anglo American than Mexican American students. Evans & Anderson concluded that the depressed achievement of Mexican American students was not due to a lack of parental emphasis on achievement in school but to values and experiences associated with their marginal status, namely, lack of independence training and fatalistic, present time orientations.

Keying on independence training, Evans & Anderson suggested that Mexican American students from lower class neighborhoods may experience greater achievement in more structured classroom situations. Since achievement motivation and achievement oriented values accounted for only twenty-three percent of the variance in English achievement scores of Mexican American students, but fifty-eight percent of the variance for Anglo American students, Evans & Anderson further suggested that other school factors may have more of an effect on students from minority groups than they do on other students. That is, aside from achievement motivation related factors, the arrangement of the school environment may be especially critical to the achievement and potential social mobility of Mexican American students.

In another study of Mexican American students, Ramirez, Taylor & Peterson (67) attempted to determine whether there were significant differences in nAch between lower class Anglo American and Mexican American students, but did not correlate this to academic achievement. The study disclosed that there were significant differences in nAch scores between these groups as measured by a thematic apperception test. These differences were attributed to variations in orientations toward achievement between Mexican American and Anglo American cultures. In particular, the authors postulated that Mexican Americans emphasize achievement for the group rather than the individual and they suggested "that in order to increase the chance for academic success of the Mexican American child, changes must be made in both the system and in some of the attitudes, perceptions, and behaviors of the child." (p. 277)

These reviewed studies suggest:

1. that there is some evidence that achievement motivation and school achievement are correlated;

2. that high nAch and value orientations conducive to social mobility are distributed disproportionately among members of the middle class;
3. that there is contradictory evidence with respect to the nAch of Mexican American students relative to Anglos; and
4. that school factors other than nAch, especially arrangement of the school environment, may be more important in influencing the school performance of Mexican Americans than achievement motivation.

The present study should be particularly helpful in providing additional information about two issues:

1. whether the arrangement of the school environment represented by the ESP treatment did affect the motivational levels and/or academic performance of Mexican American students, and
2. whether the motivational variable itself accounted for a significant amount of the variance in the school achievement of Mexican American students.

The four year longitudinal design should reduce the time difficulties experienced in many of the previous studies.

Academic Attitudes

Many of the school attitude studies of Mexican American students not only lacked rigorous empirical controls but have also consistently dealt primarily with cultural and socioeconomic differences between Mexican American students and their teachers, finding the latter far too conservative for effective education. Several essays have also discussed attitudes specific to certain income levels, purporting damaging influences caused by the conflicts of values. Other studies suggested that Mexican American students' value orientations and attitudes were different from those of their Anglo counterparts. Demos (27), for example, supported the hypothesis that membership in the Mexican American culture was related to certain unfavorable attitudes toward education. Specifically, he found that Mexican American students expressed attitudes which were significantly more unfavorable than those of Anglo students in regard to completing elementary education, dropping out of school, and regular school attendance.

Ramirez & Taylor (66) obtained similar results. The Mexican Americans in their sample expressed attitudes toward education which were significantly less favorable than those of Anglo Americans.

Hepner (40) surveyed Mexican American boys and also found support for different values and attitudes. She stated that this was the cause of low classroom achievement.

Ramirez (65, p. 227), in a review of Mexican American and Anglo attitudinal differences, concluded, "the characteristics of the Mexican American students clash with the cultural values represented by school personnel, resulting in tension and unhappiness for the students." An examination of the instrument used to arrive at the findings, however, cast serious doubt on the usefulness of the data produced.

A more recent investigation, by Luebbert (52), of school attitudes of Mexican Americans, utilizing data from a school attitude measure collected over two years on large samples (1973, N=906; 1974, N=1705), concluded that "students... demonstrated attitudes and perceptions [of] their school environment which were very similar to the responses of students in other schools." In a related investigation of school value orientations of Mexican American students, Munoz (59), found that there were no significant differences between low and middle income students regarding the value of school as the center of learning, the value and need for grades, perception of the classroom climate as restrictive or dull, and respect for teachers as figures of authority. These student attitude and school value findings were contrary to many of the essays and the results of some investigations into Mexican American students' attitudes which categorized these as low and/or negative.

Croft (21), in a study of Mexican American students, found achievement in college:

1. Positively related to standardized achievement test math scores.
2. Negatively correlated to standardized achievement test scores in English and social studies.
3. Not correlated with other test scores.
4. Highly and positively related to high school grades.

The attitudinal characteristics related positively to college grades but not to the test scores.

Findings with respect to school attitudes of Mexican American students, then, are contradictory and inconclusive. Those studies which did find lower attitudes among Mexican Americans, however, usually blamed an insensitive and unresponsive school environment, suggesting that reorganization of the school would lead to better attitudes and higher academic achievement. The present study is expected to contribute to this accumulated body of research and the issues it raises by:

1. determining whether the "culturally compatible" environment represented by the ESP program lead to improved school attitudes, and
2. whether attitudes accounted for a significant amount of the variance in school achievement of Mexican American students.

The combination of variables examined (achievement, self concept, motivation, and attitudes) appeared unique in design.

Sex Differences

Previous research conducted in connection with ESP, as well as other studies in the literature, suggested that sex may be a confounding variable in achievement. With respect to self concept, a preliminary study by Sharp, Cervantes & Jones (75) found that females consistently attained higher self concept scores than males. Cervantes (10) also reported significant sex differences in a study of locus of control, self concept, and achievement of Mexican American pupils. He found that females with internal locus of control and low self concept consistently obtained the highest achievement scores of any group in his study. Similarly, Cervantes & Bernal (11) also reported significant sex differences in their investigation of Spanish and English reading performance of Mexican American students with females obtaining higher reading scores than males. A study by Evans & Anderson (34), however, found no sex difference in self concept of ability among Mexican American students.

Most general studies of achievement motivation have consistently found sex differences (41) although not in the same direction. Two studies, specifically on the Mexican American, revealed some sex differences for these students. Ramirez, Taylor & Peterson (67) found that Mexican American males scored significantly higher on a projective test measuring nAch. On the other hand, Evans & Anderson (34) found no significant differences between Mexican American males and females on measures relating to nAch, except that Mexican American females received significantly more independence training from their fathers than did Mexican American males.

On the question of school attitudes, the Ramirez & Taylor (66) study suggested that sex differences are to be expected. However, a study by Jones (45), using the English and Spanish versions of the Purdue Social Attitude Scales, found no significant sex differences in school attitudes for Mexican American children in grades K through 3.

The reviewed findings with respect to sex differences among Mexican American students on the variables of achievement, self concept, motivation, and attitudes, are inconsistent and do not suggest definitive hypotheses with respect to the direction of these differences. They do indicate, however, that sex be included in the design as a control variable.

EDGEWOOD SCHOOL PLAN TREATMENTS

The Edgewood School Plan student treatment was applied primarily in two areas: affective and cognitive. Both of these were addressed in the Final Plan (30) and in several subsequent ESP documents, especially in the Philosophy of Communications Skills (32) and Personalizing Instruction Models and Program Emphasis (31). Essentially the affective programs have been directed toward improving teacher pupil relationships through teacher workshops and conferences, and more counseling. Some efforts toward increasing the relevancy of curricular materials through the inclusion of Mexican American and local Texas topics were evidenced, particularly the first year. The use of Spanish in some classroom management and teaching was included as affective enhancement.

In the cognitive domain, most of the early elementary curricular materials produced by ESP were supplementary in use, bilingual in mode, and bicultural in content. Some training for implementation was provided. During the first three years, these were mostly directed toward K-2. Several commercial materials were made available for bilingual education. The implementation of these appeared to be at school and/or teacher option. In the fourth year, an ESP spiral mathematics program and individualized, contract approach language arts and some social studies were provided for K-6.

During the first project year some teacher-staff produced and commercial materials were team taught in the middle school. During the second and third years the materials and the team teaching procedures were revised and included mathematics, science, humanities, social studies, and language arts. These were further refined for the fourth year and the mathematics program, previously arranged in LAP* sequence, was changed to a spiral arrangement.

The beginning secondary materials were both teacher-staff produced and commercial, and were taught to limited numbers of students. Later the LAP sequence mathematics program was used for most students; this, too, was revised to the spiral arrangement for the fourth year. Social studies, language arts, and some other subjects were taught to a portion of

*LAP = learning activity package. Objectives are arranged in sequence from entry to terminal objectives for each unit or segment of learning.

ninth grade, using teacher-staff produced materials after the first year. These underwent revision through the project's life and were subsequently expanded to tenth grade.

In brief, there were diverse sets of specific and general affective, cognitive, and behavioral program treatments directed at students in the elementary, middle, and high school levels, as well as a series of treatments directed at improving teacher competencies. Detailed specification of these treatments and other related and community work was reported previously. (12)

RESEARCH APPROACH

The specific research questions for this study were:

1. Did the sample Mexican American students score below the national norm on self concept, motivation, attitudes, and achievement?
2. When controlling for sex and looking at performance over time, were there significant differences in the mean scores on self concept, motivation, attitudes, and achievement between Mexican American students in the treatment and comparison groups?
3. Were the affective variables of self concept, motivation, and attitudes predictive of school achievement for the Mexican American students?

The relationships between the experimental and sample comparison groups' achievement and the instructional program were also probed.

Research Methodology

The research design employed in this investigation was quasi-experimental and used a time series approach to collect data over the four year period. This design is illustrated in Figure 1.

Figure 1: Research Design

Cohorts/Groups		T_1	T_2	T_3	T_4
Cohorts I	Group A*	XO_1	XO_3	XO_5	XO_7
	Group B**	O_2	O_4	O_6	O_8
Cohorts II	Group A	XO_1	XO_3	XO_5	XO_7
	Group B	O_2	O_4	O_6	O_8
Cohorts III	Group A	XO_1	XO_3	XO_5	XO_7
	Group B	O_2	O_4		O_8

*Treatment
**Comparison

The design included the following classifications: samples (cross sectional) and subsamples (longitudinal), groups (treatment group A and comparison group B), and experimental treatments (X), which were measured (0) over time (T). Specifically, the time series design, with use of cross sectional samples and longitudinal subsamples, was advantageous in that it provided consistency in measurement, minimized sample and statistical bias, and allowed for partial experimental control within certain limitations. (7, 47)

Samples and Subsamples

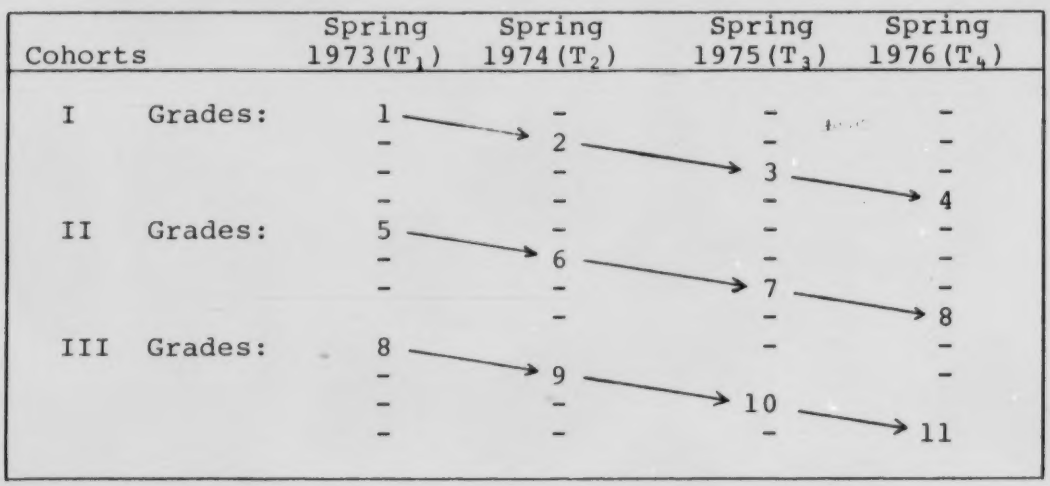
The sampling procedure consisted of testing students at selected grades in designated treatment and comparison schools. Six of the district's twenty-six schools were selected for treatment: four elementary schools and one middle and one high school. The total enrollment of these schools was 5,367 students in 1972, over ninety-two percent of whom was Mexican American, five percent Black, and less than three percent "other," including Anglos. (12)

At the inception of the investigation in September 1972, a study was undertaken to obtain a comparison group of schools from within the district with similar characteristics to those designated as treatment schools in order to ascertain treatment effects. Initially, four comparison elementary schools were selected to match the four ESP designated schools, but limited resources allowed use of only two elementary comparison schools throughout the study. Thus a comparison group of two elementary, one middle, and one high school was selected on the following criteria to match treatment schools: pupil enrollment, pupil-teacher ratio, pupil ethnicity, faculty ethnicity, economic characteristics, and previous years' achievement measures. Lack of similar and consistent achievement tests scores across all schools necessitated some subjective judgment based on limited comparable data. (28, 86) As far as the researchers could ascertain, the comparison schools selected were almost identically matched to those of ESP on these characteristics with no serious variations. Subsequent data analyses of self concept, motivation, attitude, and achievement from the fall 1973 data revealed no significant differences between treatment and comparison groups. (12)

The overall sampling design, in simplified form, is illustrated in Figure 2. As evidenced therein, three groups of cohort students were sampled and tracked for four years ($T_1 \rightarrow T_4$) through succeeding grades: Cohort I consisted of students initially tested in grade 1 and tracked through grade 4; Cohort II was those students first tested in grade 5 and tracked through grade 8; and Cohort III was composed of students initially tested in grade 8 and tracked through grade 11.

The sampling design allowed analyses of Cohorts I, II, and III both cross sectionally and longitudinally. However, cross sectional samples and longitudinal subsamples cell sizes varied considerably because of alterations in the schools' feeder system, intra and inter school transfers, in-grade retentions, and other reasons generally associated with student attrition (12). The loss of students in Cohort II, grade 8 at T_4, and Cohort III, grade 11 at T_4, was so great as to preclude meaningful analyses. Specific sample sizes are thus cited for each specific type of data analysis. All non-Mexican Americans were deleted from the sample prior to analyses.

Figure 2: Tracking Design for the Cohorts Study



Analyses of the cross sectional samples included data on all students by grade within specific time periods as in traditional main effect studies. Analyses of the longitudinal subsamples focused on examining only those students with both the affective and cognitive variables across the four years. The attrition between these samples, which appeared similar to the attrition of Mexican Americans in schools throughout the Southwest (17, 46, 73), was not expected to seriously affect the findings.

The longitudinal data could have been biased since only those students who did not move from the studied schools were included. An examination of the means of these two samples (see Appendix A1) showed a general, but not an absolute, bias in favor of the longitudinal subsamples. Most of the differences were not great, seldom exceeding two points. This pattern, however, is similar to that found in most longitudinal research:

those students who persist in a school system tend to be more favorable toward education and to score somewhat higher than those who move among schools and/or systems. Further, adjusting to new schools, teachers, and classmates often has been found to adversely affect achievement for at least a short period.

Instrumentation

Standardized instruments were used to collect student achievement and affective data. The achievement tests used were the Test of Basic Experiences, Level L (TOBE) and the Comprehensive Tests of Basic Skills, Form Q, (CTBS/Q). (22) The Self-Concept and Motivation Inventory (SCAMIn) was used to assess these two variables (52). The Student Behavior Description Questionnaire (SBDQ) was used to measure student school attitudes (21). All tests were administered in English as previous observation, subsequently documented, indicated that students performed better in English than in Spanish. (11, 43, 44)

Achievement (TOBE-CTBS/Q)

The TOBE-CTBS/Q is a well known achievement test series. The TOBE, applicable in the present study to grade 1, contains four subject area subtests of language, mathematics, science, and social studies (there is no total battery score). Raw scores and stanines are available. The CTBS/Q is applicable to four grade spans. Level 1 covers grades 2, 3, and 4; Level 2 is for grades 5 and 6; Level 3 is used for grades 7 and 8; and Level 4 spans grades 9 through 12. Students are tested in reading, language, arithmetic, and study skills at each level. A measure of general student performance through the total battery score of CTBS/Q is also available.*

These tests were developed in 1970 and 1968, respectively, and have established acceptable reliabilities and validities. In terms of the Kuder-Richardson formula 20 (KR_{20}) for measuring internal consistency, the reliability of the TOBE ranged between .73 and .84 for kindergarten and first grade. For the CTBS/Q, the KR_{20} coefficients ranged between .75 and .96 over all grades with most of the coefficients being over .80. More detailed analyses of the reliability, validity, norms, and other characteristics of the TOBE and CTBS/Q are available elsewhere (12, 22).

*The CTBS/Q total battery score is the sum of the reading, language, and arithmetic raw scores.

Self-Concept and Motivation Inventory

Although there are several self concept and motivation instruments available, the age/grade ranges are limited. The instrument used in this study was the Self-Concept and Motivation Inventory (SCAMIn). (58) The SCAMIn was used in this study because it affords the researcher a standarized instrument with a wide age range. It was reported to measure aspects of the students' school self to a greater degree than the Coopersmith Self-Esteem Inventory (63).

The SCAMIn consists of the subtests of Role Expectation and Self Adequacy which constitute Academic Self Concept, and the subtests of Achievement Needs and Achievement Investment which constitute Academic Motivation. Briefly explained, self concept was "...how a child views his role as a learner in school. It is the student's sum of experiences, perceptions, attitudes, and feelings about school and schoolwork." Motivation was defined as "...the expressed need of a child to achieve a goal in school, and the moderate avoidance of the child toward failure in school..." (58) Three SCAMIn forms were used in this study: the early elementary form, which covered first, second, and third grades; the later elementary form measured grades four through six; and the secondary form was used for grades seven through twelve.

The instrument was normed on groups of students of approximately 1000 for each of the SCAMIn forms. The students in each group were characterized by the instrument designers as mostly lower middle class, and from either the Detroit and Southeastern Michigan areas, or the area surrounding Los Angeles, California.

The reliability of the early elementary form, test-retest given two weeks apart, was .77 (N=350). The internal consistency for the later elementary form, expressed in Spearman-Brown terms, was .83 (N=440) and .93 (N=200) for the secondary form.

The designers of the instrument reported concurrent validity correlations of .76 with semantic differentials (71). Criterion related validity coefficients for other Whites and for self concept was .76; for Blacks and self concept, .51; and role expectation and self concept .73. No values were reported for Mexican Americans.

The major weakness of the SCAMIn is that it is not an absolute measure of the teacher's or school's influence on the motivation and self concept of the children. For example, if a student scores low on all the subtests one year and then scores high the next year, some of the improvement recorded may be attributable to parental influence on the child as well as the

effects of his current teacher. Children who come into a class with high motivation and self concept already established at home, may not drop on their SCAMIn scores the next year, even if they have a teacher who does not motivate them or reinforce their esteem.

Despite these drawbacks, no other instrument reviewed contained "absolute" measures of student motivation and self concept. Because of the advantages offered by the SCAMIn, in terms of its reported measures, reliability, validity, norms, grade range, and ease of data processing, the instrument was used in this study.

Student Behavior Description Questionnaire

The Student Behavior Description Questionnaire (SBDQ) was used to measure the attitudes of the students in grades 4 through 10. This instrument is prepared in two forms, an elementary form applicable to grades 4 through 6 and a secondary form designed for grades 7 through 12. (20)

The SBDQ is composed of items that operationally delineate attitudes toward achievement, inclusion, and affiliation. Four subtests, selected by factor analysis procedures, make up each construct. The achievement construct was derived from the subtests entitled academic, structure, thrust, and independence. Inclusion was measured by subtests listed as unacceptance, inclusion, domination, and disinterest. The third construct, affiliation, was derived from the subtests of friendship, intimacy, consideration, and participation. The SBDQ additionally identified respondents as one of eight student "types." These were social leaders, ambivalents, unaccepted participators, parent-dominated non-participators, achievers with many friends, achievers with few friends, dependent socializers, and accepted socializers. Neither the sub-subtests nor student types data were utilized in this study.

The instrument was standardized (N=3,900) with samples of students in the Southwestern part of the United States who were from low and middle income families. Ethnic groups included in the standardization process were Anglo American, Spanish/Mexican American, Negro, Indian, and Oriental American. The test author claimed that the SBDQ norms were relatively culture free because of the inclusion of such a wide variety of backgrounds included in the instrument norming samples.

Adequate reliability and validity measures have been established for the SBDQ. The average coefficient of stability (test-retest) for the twelve subtests of the instrument was computed at .75. Also, two multiple regression analyses were carried out for the SBDQ which demonstrated its validity in relation to a number of biographical characteristics of the sample students. (21)

Data Analyses

Analysis of variance (ANOVA), repeated measures ANOVA, and multiple regression were the main statistical techniques employed. ANOVAs were first used to determine significant effects using the cross sectional samples, controlling for group and sex, as in traditional main effect studies. Following, ANOVAs were used on the longitudinal subsamples within each year, including only those students on which self concept and motivation scores were available, in addition to those of attitude and achievement. Repeated measures ANOVAs were then used on the longitudinal subsamples to determine possible significant differences over time. Finally, multiple regression and canonical correlation analyses were used to determine whether the affective traits of students were associated with their cognitive performance.

Prior to the repeated measures analyses, raw scores were linearly transformed into T-scores using the procedures explained in J. C. Nunnally, Educational Measurement and Evaluation, second edition, New York, McGraw-Hill, 1972, p. 549. Most of the statistical analyses were performed utilizing the Nie et al, Statistical Package for the Social Sciences, second edition, New York, McGraw-Hill, 1975, specifications. An exception was the improved program for canonical correlation analysis developed by M. Yost, Jr. & E. F. Hughes, Canonical Correlations, Ft. Lauderdale, Florida, Nova University, 1976. The repeated measures analyses were conducted through the W. J. Dixon (ed.), Biomedical Computer Program (BMDP2V), Berkeley, University of California Press, 1973.

RESEARCH FINDINGS

The results of the three phases of the present research are presented uniformly:

- Description of the analysis procedure or procedures
- Presentation of the data with appropriate summary tables and/or figures illustrating the findings from the data
- Summary of the major findings

Detailed data presentations and analysis tables are included in the appendices, following the same order as the findings are included in the narrative. When a major research question is divided into subquestions, each is presented in turn, with the appropriate analysis procedures and findings.

Research Question One: Cognitive and Affective Performance of Samples Relative to National Norms

It is frequently assumed that Mexican American students have lower self concept and motivation than other White students. Moreover, there is a variety of documentation indicating that the achievement level of Mexican Americans is below the national norms. To ascertain whether this were true for the samples of this study, the question was examined in two sub-questions:

1. Whether the assumption of low Mexican American affective characteristics was true for the Edgewood sample, and

2. Whether, consistent with other findings, the sample students scored below the national norms.

Standardized measures were derived for both the affective and cognitive variables in these determinations.

The procedure used was descriptive, comparing sample stanines to the norm stanine of five in the case of self concept, motivation, and achievement, and to the norm T-score of 50 in the case of attitudes.* Self concept and motivation were examined first, followed by attitude and achievement.

Academic Self Concept and Motivation

As illustrated in Figure 3, the self concept stanines for grades 1-10, treatment and comparison combined, were at or above the norm. Grades 1 and 2 scored at the fifth stanine; grades 3-6 at the sixth stanine; and grades 7-10 at the fifth stanine. These data revealed that for the sampled Mexican American students, self concept was both relatively stable when expressed in stanines and was at or above the norm. (The data are contained in Appendices A2, A3, and A4.)

In contrast, motivation, when expressed in stanines, was below the norm except at grades 3-5. The motivation data in Figure 3 revealed an upward progression from the third stanine at grade 1 to the sixth stanine at grade 4. It then declined to a five at grade 5, and to the fourth stanine at grade 6, where it remained through grade 10.

*Normative data for the attitude variables were available in T-score format from the analyses performed by Croft (20) at the Education Research Center, New Mexico State University.

These data show that the academic self concept of Mexican American students was at or above the norm group throughout the grades studied. Academic motivation, however, was below the norm except for the elementary grades 3-5.

Academic Attitudes

The academic achievement, affiliation, and inclusion attitude T-scores were generally at the norm ($\bar{X}$=50; sd=10) across all experimental and comparison grades, as evidenced in Figure 4. None of the attitude construct scores exceeded one standard deviation from the mean. The scores reflected considerable stability throughout and were very similar to those obtained by the norm group. The scores near the mean signify that the sample Mexican American students expressed "average" amounts of interest in academic achievement, obtained social satisfaction from the interpersonal relationship with their school friends, and felt they were accepted members of school groups. In brief, the students reflected expressions of attitudes regarding achievement, affiliation, and inclusion that were quite similar to responses of students elsewhere, regardless of ethnicity.

Academic Achievement

Stanines for total academic achievement, as compared to the national norm, are presented in Figure 5. Examination demonstrates that the pooled sample's stanines were below the norm in all grades examined. The grade 2 stanine was four; grades 3, 5, 6, 8, 9, and 10 each had a stanine of three; and grades 4 and 7 each had a stanine of two. This pattern of academic achievement for the pooled sample is virtually identical to that previously reported for this school district, based on a larger sample of about 8,500 students. (12) These standard measures, then, graphically illustrate that the achievement level of the pooled sample was seriously below the national norm.

Summary for Research Question One

Many educational practitioners have commonly assumed that, ipso facto, Mexican American students have low and/or negative academic self concept, motivation, and attitudes. The data in the present study indicated that with respect to self concept and attitudes, that assumption was without foundation for the students in these samples. Although motivation was below the norm, it was not consistently so in that students in grades 3, 4, and 5 were at or above the norm. The achievement level of all students in the sample was below the norm. However, low motivation and achievement should not be ascribed as characteristic of this minority group since

Figure 3 : Self Concept and Motivation Stanines by Grade, Pooled Sample

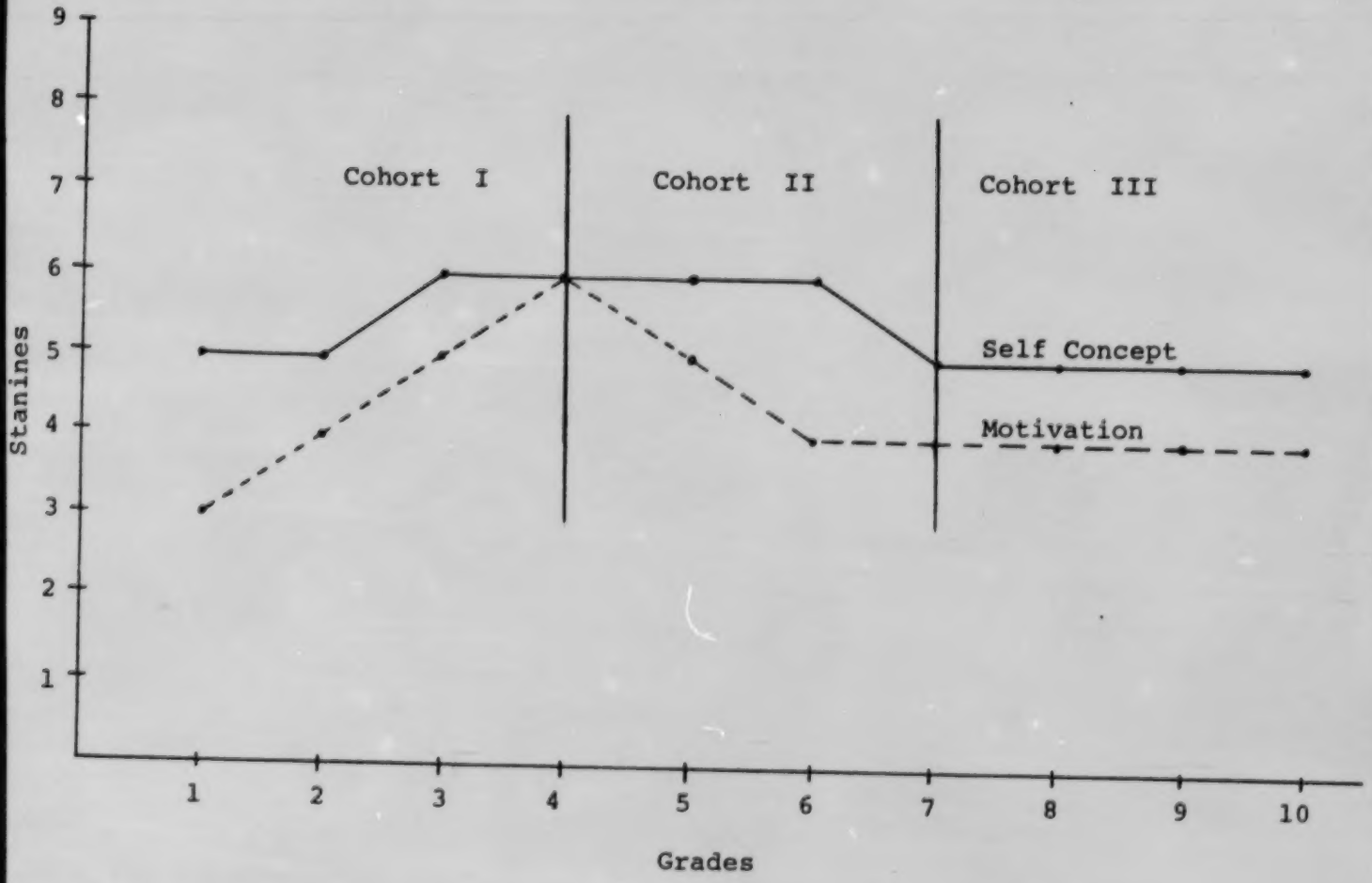
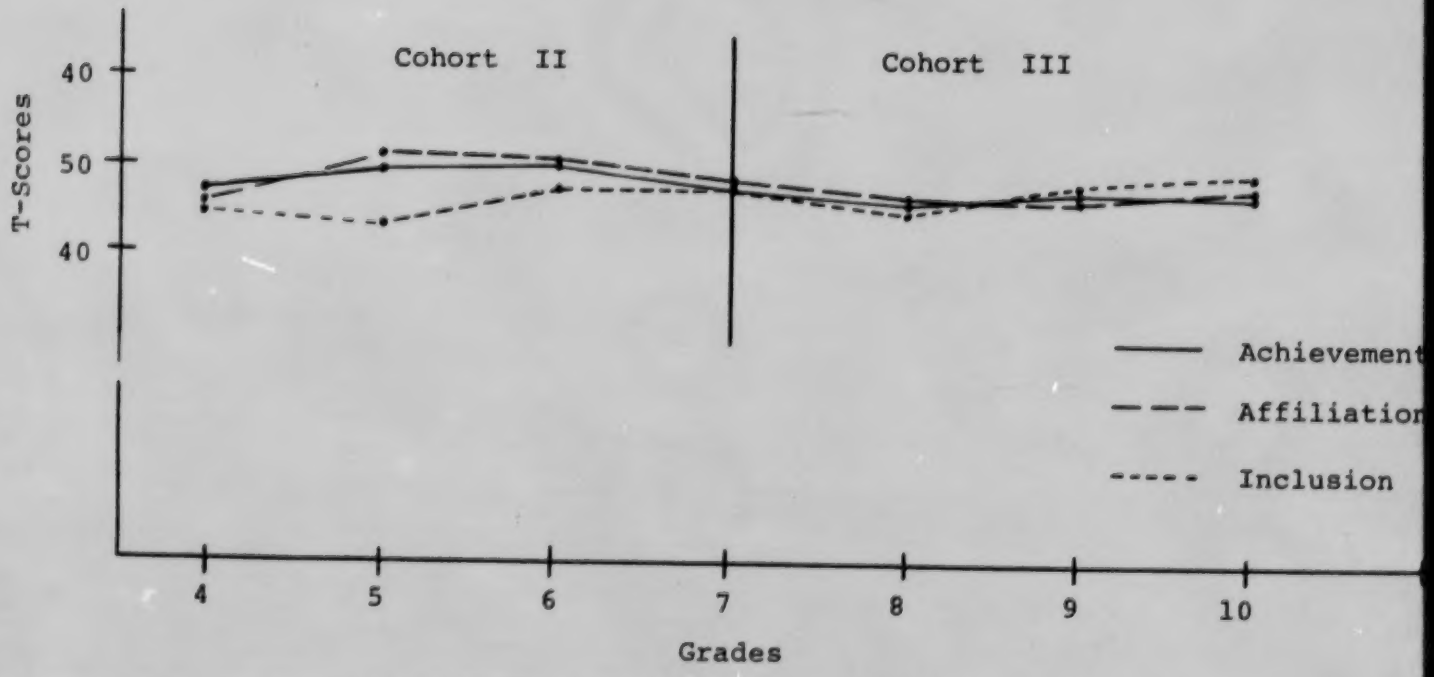
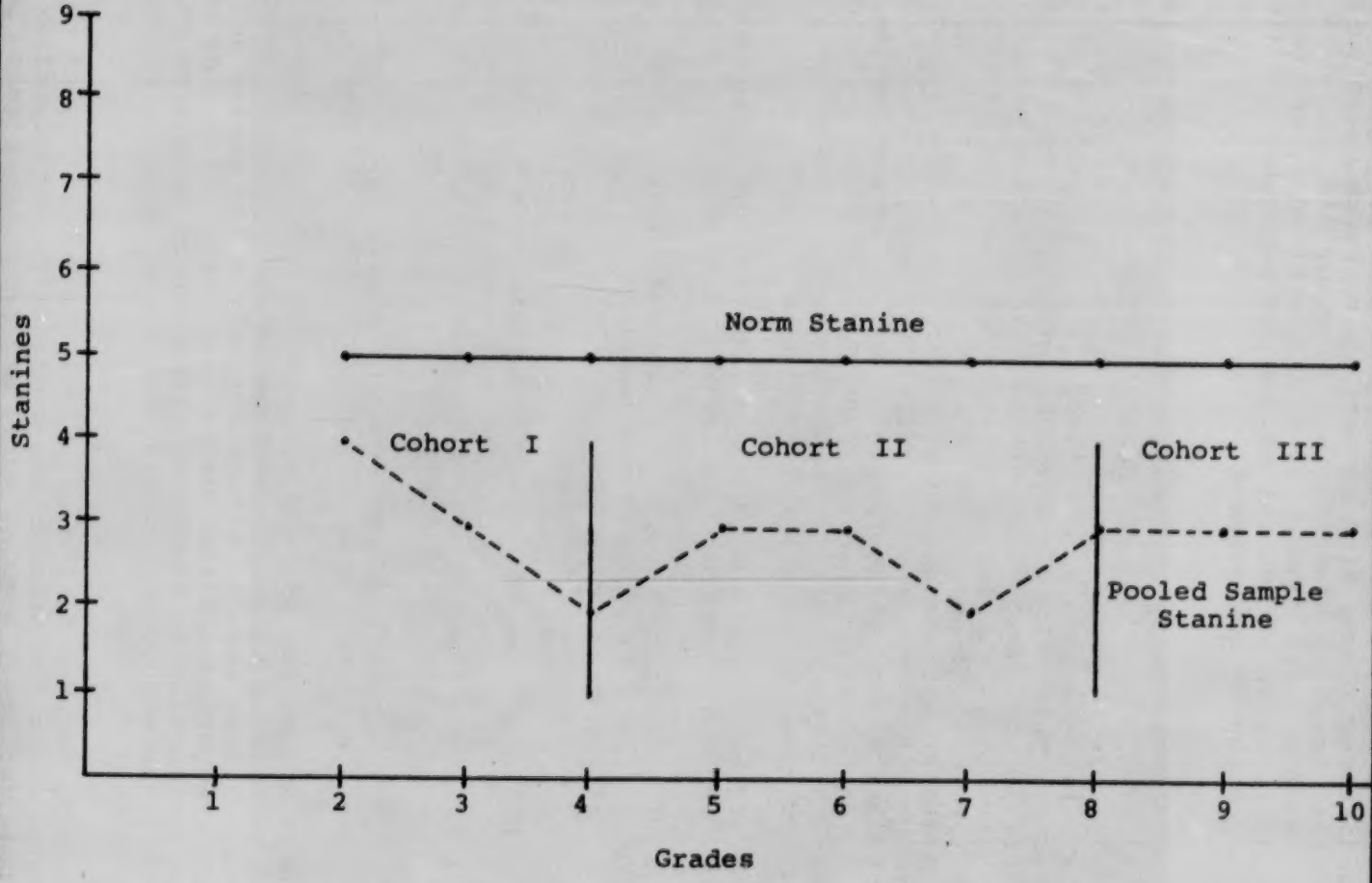


Figure 4: SBDQ Attitude Scores by Grade, Pooled Sample*



*Cohort I excluded since SBDQ is not applicable to grades 1-3.

Figure 5: CTBS/Q Total Achievement Stanines for National and Pooled Sample*



*Grade 1 excluded since no total battery score is calculated for TOBE.

causality may have resided in numerous educational institutional factors and practices, as well as socioeconomic conditions. Thus, with respect to research question one, Mexican American students in this study did not score below the norm on self concept or school attitudes, and only slightly below on motivation, but considerably and consistently below on achievement.

Research Question Two: Efficacy of Treatment Program

The foregoing data demonstrated that the sample Mexican American students scored about the norm on the affective variable and below the norm on the cognitive variable of achievement. The investigation then examined possible treatment effects to answer the second question: Was there a difference between students in the treatment and comparison groups with respect to the affective variables of self concept, motivation, and attitudes, and/or with respect to the cognitive variables of reading, language, arithmetic, total achievement, and study skills? Each group was examined separately with respect to research question two.

The affective and cognitive variables for each cohort group were subjected to three separate analyses:

1. The total sample for any period with complete sets of scores was analyzed cross sectionally, that is, cross sectional analyses of the cross sectional samples.

2. Those students with complete sets of scores across the cohort time period were then analyzed cross sectionally: cross sectional analyses of the longitudinal subsamples.

3. Finally, repeated measures analyses were performed across time on the longitudinal subsamples.

There were three primary reasons for this procedure. First, the specific treatments were not uniform across grades and years. Some were in effect for only a few grades and for limited periods, often one year or less. If any of these were effective in producing affective or cognitive change, then, the measurement would have to be specific to their existence in time.

Second, because of the relatively high mobility of the students among the schools and among different districts, the cross sectional samples were much larger than those in the longitudinal subsamples. Where differences between these two were large, certain aspects of the treatment program that

would effect those remaining in the program over the four years, in contrast to those that did not, would be important to the findings.

Third, although the classroom specific treatments varied considerably, there were some general activities of the experimental program that could be said to span the four years. Staff development, provision of certain supplies and instructional materials, an environment in which the culture of the Mexican American students would be stressed, and greater attention to community needs through family services were among these. Repeated measures ANOVAs, determining changes over time, were therefore justified even though the cell sizes for some of the grades were substantially lowered.

Cross Sectional Analyses/Cross Sectional Samples*

Relatively large numbers of students were present in these samples since those with complete sets of scores for the variables were examined year by year. Both the affective and the cognitive variables were analyzed by grade in each of the cohort groups.

Affective Variables

In order to answer the affective portion of the second research question, analyses of variance were performed for students in Cohorts I, II, and III. In Cohort I, grades 1-3, the affective variables were limited to self concept and motivation since the attitude variables were not applicable to these grades. The attrition reduced the Cohort II, grade 8, and Cohort III, grade 11, samples to Ns too small for meaningful cross sectional analyses on the longitudinal subsamples.

At grades 1, 2, and 3 of Cohort I there were no significant differences between the treatment and comparison groups on any of the affective variables examined. Similarly, there were no significant group differences found on any of the variables when sex was used as a control variable.

Analyses of the last year of Cohort I, grade 4, data revealed a significant group main effect ($p<.03$) on inclusion attitude. In this case, the treatment group sample scored somewhat higher than comparison.

*The tables from the statistical analyses in which significant differences occurred for this section are included in Appendix B and are arranged sequentially as the results are discussed in the narrative.

Analyses for Cohort II were conducted on five affective variables: self concept, motivation, achievement attitude, affiliation attitude, and inclusion attitude. Analyses of the grade 5 cross sectional sample yielded no significant group main effects for any of the affective measures. There were, however, significant sex main effects present for motivation ($p<.001$) and inclusion attitude ($p<.01$). On both these affective variables, females attained higher mean scores than males.

The Cohort II grade 6 analyses revealed no group main effects on any of the variables examined. There was, however, a group and sex interaction effect on achievement attitude ($p<.01$) and on affiliation attitude ($p<.03$). In each case, the nature of the interaction effect was the same. Treatment males attained higher mean scores than treatment females, while comparison females attained higher mean scores than their male counterparts. In addition, there were significant sex main effects on motivation ($p<.04$) and inclusion attitude ($p<.05$). In each case, females attained significantly higher mean scores than did their male counterparts.

In the analyses of the grade 7 data, there were no significant interaction effects on any of the variables. Similarly, there were no significant main effects for either group or sex on any of the variables.

Sex yielded a significant main effect at grade 8 in Cohort III on motivation ($p<.02$) and inclusion attitude ($p<.03$). The main effect in each case was due to females attaining higher mean scores on each of these measures than did males. Analyses of the grade 8 sample revealed no significant main effects for group and no group and sex interaction effects. There were no significant main or interaction effects for either grade 9 or 10 on any of the variables examined in this study.

Cognitive Variables

In order to ascertain possible significant effects on the cognitive variables of reading, language, arithmetic, total achievement, and study skills, similar analyses as those previously used in the affective variables were performed on these cognitive variables. The analyses included use of the identical sample and grades as in the preceding analyses. At grade 1, the achievement data were limited to the TOBE subtests of mathematics and language (the science and social studies results will be reported elsewhere). The attitude measures were not applicable to grades 1-3.

At grades 1 and 2 of Cohort I there were no significant group effects between treatment and comparison. Similarly, there were no sex differences. The grade 3 analyses revealed significant sex differences on reading ($p<.04$), language ($p<.01$),

and total achievement ($p<.03$). There were no group main effects nor group and sex interaction effects.

At grade 4 of Cohort I there were a large number of significant differences. Group differences were present for all five cognitive variables investigated (language, $p<.001$; reading, $p<.02$; arithmetic, $p<.05$; total achievement, $p<.01$; study skills, $p<.001$), with the comparison group consistently achieving higher scores than the treatment group. Sex differences were also present for all cognitive variables (language, $p<.001$; reading, $p<.01$; arithmetic, $p<.03$; total achievement, $p<.001$; study skills, $p<.02$). Consistent with previous findings, females attained higher mean scores than males.

Two group and sex interaction effects were also detected on total achievement ($p<.04$) and study skills ($p<.02$). The nature of this interaction effect was that females in the treatment group scored significantly higher than their male counterparts while females in the comparison group scored about the same or slightly lower than males.

Inspection of the reading, language, and total battery means revealed a distinctive pattern: females consistently obtained the highest means across groups. There was a particularly pronounced and significant sex effect in which females obtained higher means than males in grades 3 and 4 on the cognitive variables. This finding is consistent with much of the previously reported achievement research among Mexican Americans.

Analyses of grade 5 in Cohort II yielded a significant group main effect on the arithmetic subtest ($p<.03$). In this case, the treatment group achieved a higher mean score than did the comparison group. There was also a significant group and sex interaction effect ($p<.01$). The differences in mean arithmetic scores were much greater for males and females in the comparison group than in the treatment group. Treatment males scored slightly higher than treatment females, while comparison females scored much higher than comparison males. A sex main effect ($p<.01$) also emerged on the language subtest, which was attributed to the higher means obtained by females as compared to males.

At grade 6 there were significant main effects for sex on the language subtest ($p<.01$) and on study skills ($p<.02$). As in many of the previous analyses, females had higher mean scores than males.

The Cohort II grade 7 analyses produced significant group and sex interactions on the language subtest ($p<.01$) and on study skills ($p<.03$). In both instances, the interaction effect

resulted from females in the treatment group scoring only slightly higher than treatment males, while in the comparison group, females scored very much higher than their male counterparts.

The analyses of the Cohort III grade 8 data revealed a significant sex main effect on the language subtest ($p<.001$) and on the total achievement battery ($p<.05$). The significance was due to the higher mean score obtained by females as compared to males. No other significant differences were found for grade 8, nor were there any significant differences at either grade 9 or 10.

Summary: Cross Sectional Analyses/Cross Sectional Samples

Of all the analyses performed on affective variables for Cohorts I, II, and III, only ten significant effects were found. Seven of these were sex main effects with females generally performing better than males; two were interaction effects, and only one was a group main effect. The majority of the significant effects, 6, were present for Cohort II students in the intermediate elementary years. While the one group effect which occurred on inclusion attitude at grade 4 favored the treatment group, the overall analysis of program impact on affective variables across cohorts warrants the conclusion that the treatment was not efficient in promoting the psychosocial growth of participants relative to students not participating in the program.

Analyses of the cognitive variables for Cohorts I, II, and III did yield an increased number of significant effects, 26. Over half of these, however, were attributable to sex effect with females consistently evidencing higher cognitive achievement than males. An additional one-fourth of the significant results was due to sex and group interactions. Five of the six significant group main effects occurred at grade 4 and in all cases were opposite to the direction predicted by the treatment model, i.e., students in the comparison group evidenced significantly higher mean cognitive achievement than students in the treatment group. The additional group main effect was present at grade five for arithmetic achievement and, in this case, favored the treatment group. With respect to the cognitive domain, then, the conclusion must be reached that the treatment was not more efficacious in promoting the cognitive growth of participants relative to students who were not participants.

Cross Sectional Analyses/Longitudinal Subsamples*

The previous analyses of cross sectional samples yielded some suggestive insights about group and sex effects at particular points in time but, nevertheless, suffered from a lack of constancy with respect to the internal composition of cohorts from one grade to the next. In order to eliminate the possible biasing effects which could occur across grades as a consequence of this alteration in sample composition, while at the same time preserving the insights gained from a grade by grade examination of the data, cross sectional analyses were performed on a longitudinal subsample of those students included in the previous analyses.

Affective Variables

The longitudinal sample for the affective study consisted of those students in the larger sample for whom affective data (self concept and motivation) were available for all grades tracked within each cohort. As with other longitudinal samples, it suffered the typical disadvantage of loss of size due to attrition.

Results of the cross sectional analyses of the longitudinal subsamples at grades 1, 2, and 3 of Cohort I yielded no significant effects whatsoever on the affective variables of self concept and motivation. At grade 4, however, there was one significant group main effect ($p<.02$) which resulted from treatment group students attaining significantly higher mean scores on inclusion attitude than students in the comparison group.

Cross sectional analyses of the longitudinal subsample at grade 5, Cohort II, yielded only one significant effect for the five affective variables examined. This was a sex main effect ($p<.04$) on inclusion attitude deriving from the fact that females attained significantly higher mean scores on this variable than males.

Results for Cohort II's grade 6 also yielded only one significant effect - in this case, a sex main effect ($p<.02$) on achievement attitude. Unexpectedly, however, the nature of this effect was that males achieved a higher mean score than females - a reversal from all previous findings in the study

*Appendix C contains the tables from which the significant findings are reported in this section. They are arranged sequentially as they are discussed in the narrative.

with respect to sex main effects. No significant main or interaction effects were present at grade 7 for any of the five affective variables investigated.

When the affective variables for Cohort III were examined at grades 8, 9, and 10, only one significant effect was found. This was a sex main effect ($p<.03$) on motivation for students at grade 8. As with virtually all previous findings of the study on sex as a main effect, females attained a significantly higher mean score on motivation than did the males.

Cognitive Variables

The cross sectional analyses of Cohort I achievement for the longitudinal subsample at grades 1 and 2 revealed no significant effects on the five cognitive variables examined. (Reading, total achievement, and study skills were not applicable at grade 1.)

At grade 3 no significant group or group and sex interaction effects were present on any of the cognitive variables. However, there was a significant sex effect present on three variables: reading ($p<.04$), language ($p<.001$), and total achievement ($p<.03$). Females consistently attained significantly higher mean scores than males.

Analyses of grade 4 yielded a large number of significant results. Group effects were present for all five of the cognitive variables except reading (language, $p<.03$; arithmetic, $p<.01$; total achievement, $p<.04$; study skills, $p<.03$), while sex effects were present for three of the variables: language ($p<.001$), arithmetic ($p<.02$), and total achievement ($p<.03$). The group effect, however, was in the opposite direction predicted by the treatment model - comparison group students consistently attained higher mean scores on language, arithmetic, total achievement, and study skills than students in the treatment group. As in most previous cases where a sex effect was present, females attained higher mean scores on the three cognitive variables noted above than did their male counterparts.

Cross sectional analyses of the Cohort II longitudinal subsample yielded no significant effects of any kind at grade 5. At grade 6, however, there was a significant group ($p<.05$) and group and sex interaction effect ($p<.02$) on one cognitive variable, arithmetic. In this instance, the group effect stemmed from the treatment group students attaining somewhat higher mean arithmetic scores than comparison group students. The interaction effect was attributable to treatment males scoring slightly higher than treatment females, while comparison females scored very much higher than their male counterparts. At grade 7, once again, no significant main

or interaction effects were evidenced for any of the five cognitive variables examined.

For students in Cohort III, cross sectional analyses of the longitudinal subsamples yielded no significant effect of any kind on any of the cognitive variables examined.

Summary: Cross Sectional Analyses/Longitudinal Subsamples

Analyses of the affective variables across longitudinal subsamples of Cohorts I, II, and III yielded a considerably reduced number of significant effects, 4. Three of these were sex main effects in which, with one exception, females attained higher mean scores than males. The group main effect, which favored the treatment group, occurred at grade 4 on inclusion attitude. A necessary conclusion from the total analysis is, once again, that the presence of a treatment program was not generally associated with increased affective scores.

There was also a reduced number of significant results present with respect to the cognitive variables examined: 11. Slightly more than half of these significant results were sex main effects with females generally attaining higher mean achievement scores than males; one significant result was a group and sex interaction. Three of the four significant group main effects occurred at grade 4 on the variables of arithmetic, total achievement, and study skills. In each case, the group effect was opposite to that predicted by the treatment model, i.e., students in the comparison group attained significantly higher mean achievement scores than students in the treatment group. The fourth significant group main effect, which favored the treatment group, occurred at grade 6 on the arithmetic achievement test. Results of the total analysis, then, lead to the conclusion that the treatment program had not enhanced the cognitive growth of participants relative to that of students not participating in the treatment.

Summary of Cross Sectional Analyses

A summary of significant differences obtained in the cross sectional analyses of the cross sectional samples and longitudinal subsamples by variable, grade, and source within table reveals several patterns:

1. Few significant effects were found in relation to the number of analyses performed.
2. When significant effects were present, they occurred more frequently with respect to cognitive than to affective variables. No significant effects whatever emerged for the affective variable of self concept.
3. With the exception of grade 4, when significant effects were present, they were due primarily

Table 1: Summary of Significant Differences of Cross Sectional Analyses of Cross Sectional Samples and Longitudinal Subsamples by Variable, Grade, and Source*

Variable	Cross Sectional Sample										Longitudinal Sample									
	Grades										Grades									
	1	2	3	4	5	6	7	8	9	10	1→2	→3→4		5→6→7			8→9→10			
Motivation	-	-	-	-	S	S	-	S	-	-	-	-	-	-	-	-	S	-	-	
Self-Concept	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Achievement Attitude	na	na	na	-	-	I	-	-	-	-	na	na	na	-	-	S	-	-	-	-
Affiliation Attitude	na	na	na	-	-	I	-	-	-	-	na	na	na	-	-	-	-	-	-	-
Inclusion Attitude	na	na	na	S	S	S	-	S	-	-	na	na	na	G	S	-	-	-	-	-
Reading	na	-	S	S,G	-	-	-	-	-	-	na	-	S	-	-	-	-	-	-	-
Language	-	-	S	S,G	S	S	I	S	-	-	-	-	S	S	-	-	-	-	-	-
Arithmetic	-	-	-	S,G	G,I	-	-	-	-	-	-	-	-	S,G	-	G,I	-	-	-	-
Total Achievement	na	-	S	S,G,I	-	S	-	S	I	-	na	-	S	S,G	-	-	-	-	-	-
Study Skills	na	-	-	S,G,I	-	S	I	-	I	-	na	-	-	G	-	-	-	-	-	-

*Designations: na=not applicable; S=sex difference; G=group difference; I=interaction effect.

to sex or in some cases to a sex and group interaction effect. A general finding was that females attained higher mean scores than males and that interactions were the result of a tendency for females in the treatment group to score significantly higher than males, while females in the comparison group scored about the same or slightly lower than the males.

4. The finding of consistent group differences with respect to cognitive performance at grade four was in contrast to the near absence of such differences in the other grades. Furthermore, the direction of these differences was opposite to that predicted by the treatment program, namely, the comparison group students did significantly better than students in the treatment group.
5. More significant effects were found at grades 3 through 6 than at any other level. With the exception of grade 4, these significant effects were usually due to sex main effect or to a sex and group interaction effect. If findings based on this sample can be generalized, this may indicate that although male and female pupils are intellectually similar in the early primary grades, sex differentiation becomes significant in the later primary grades. The question of differential academic achievement by sex in the later grades would thus appear to merit increased attention.
6. A number of significant effects present for the cross sectional sample dropped out when the longitudinal subsample was employed. However, those significant effects which remained for the longitudinal subsample were generally identical to those discovered for the cross sectional sample.
7. Finally, no definitive trend of effects was consistent across all three cohort groups.

In brief, then, the data did not demonstrate a measurable impact of the treatment programs in enhancing the psychosocial growth of students nor in increasing their academic achievement.

Repeated Measures Analyses/Longitudinal Subsamples*

To further examine possible treatment effects across time, a longitudinal subsample of students was isolated, comprised of

*The tables from which the significant findings are discussed in the narrative are included in that same sequence in Appendix D.

all students in each cohort group (I, II, and III) for whom the appropriate affective and cognitive scores were available every year. These subsamples held maturational factors constant across groups and permitted examination of trends within and between groups, but suffered the disadvantage typical of longitudinal studies, i.e., loss of sample size due to attrition, especially pronounced for the latter years tracked within each cohort. To increase comparability across different forms of the same instrument, all raw scores were converted to T-scores prior to analysis. Each grade was, of course, a separate year within the tracking of each cohort group and became a unit of analysis for the repeated measures study.*

Affective Variables

Affect was limited in Cohort I to self concept and motivation since the attitude constructs instrument was applicable only to Grade 4 in this group. In cohort groups II and III, self concept, motivation, and the three attitude constructs were all analyzed.

The repeated measures ANOVA on Cohort I produced no main effects for group or sex; no interaction effects with respect to these two variables were present. The only significant main effect evidenced was for year ($p<.001$). Reference to the overall means by years indicated that the mean self concept T-scores for each group (treatment and comparison) remained steady for years 1, 2, and 3, but increased dramatically (20 points) at year 4. This increase may have been an artifact of the instrument form change between grades 3 and 4. (See Figure 6 for the self concept trends.)

No main effects were found for group or sex in Cohort I nor were there interaction effects present for these two variables. There was, however, both a significant main effect for year ($p<.001$) and a significant three-way interaction effect ($p<.01$) for year, group, and sex. The year effect was due to the marked increase in the mean motivation score which occurred at year 4. As in the case of self concept, this may have been due to the change in instrument forms between years 3 and 4. The three-way interaction effect seemed to derive from the fact that in the treatment group the mean motivation score of males

*In the repeated measures analyses, the test by "trials" is synonymous with the "years" of the present study, therefore, the latter term is used herein.

Figure 6 : Self Concept Trend Lines by Cohort Group

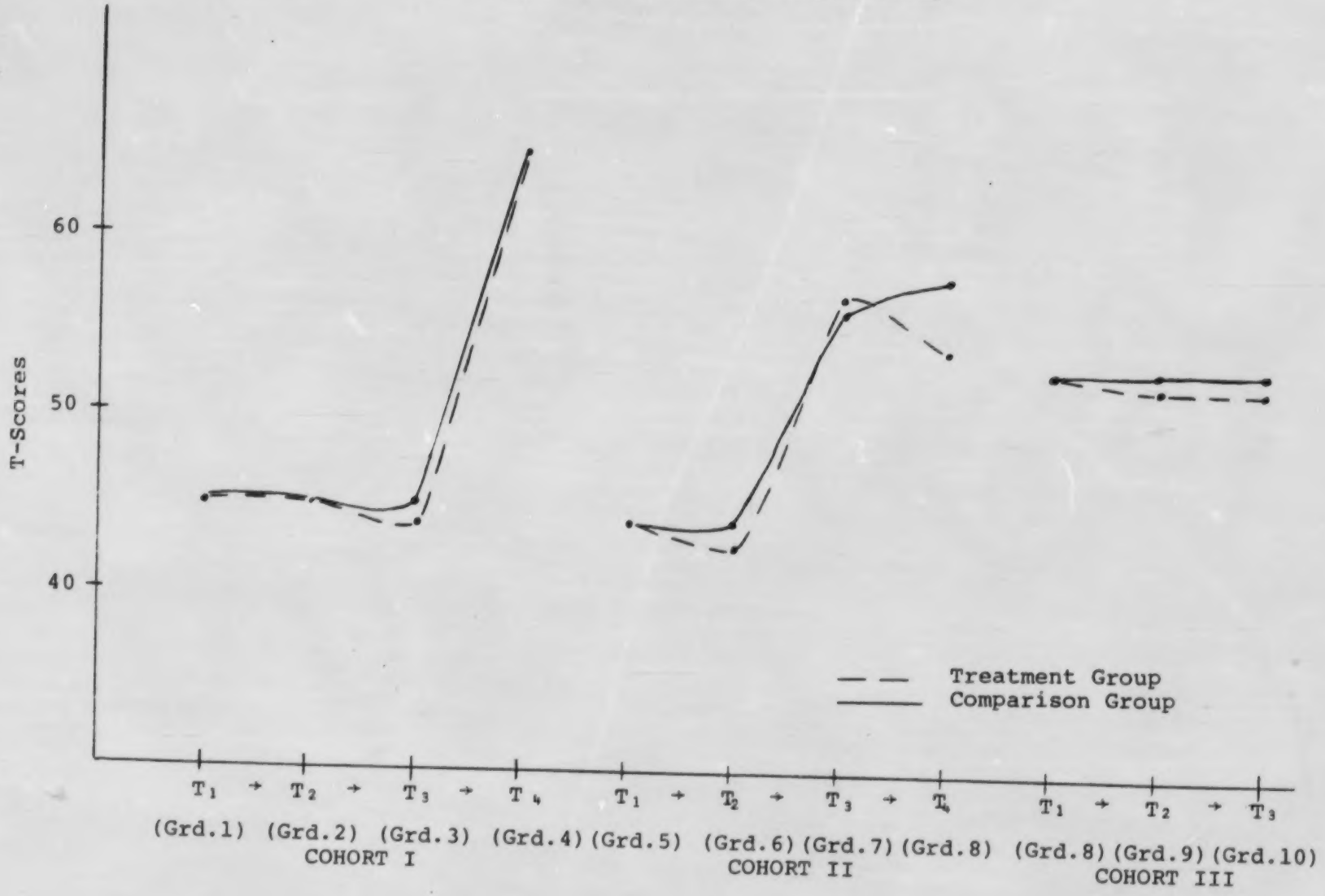
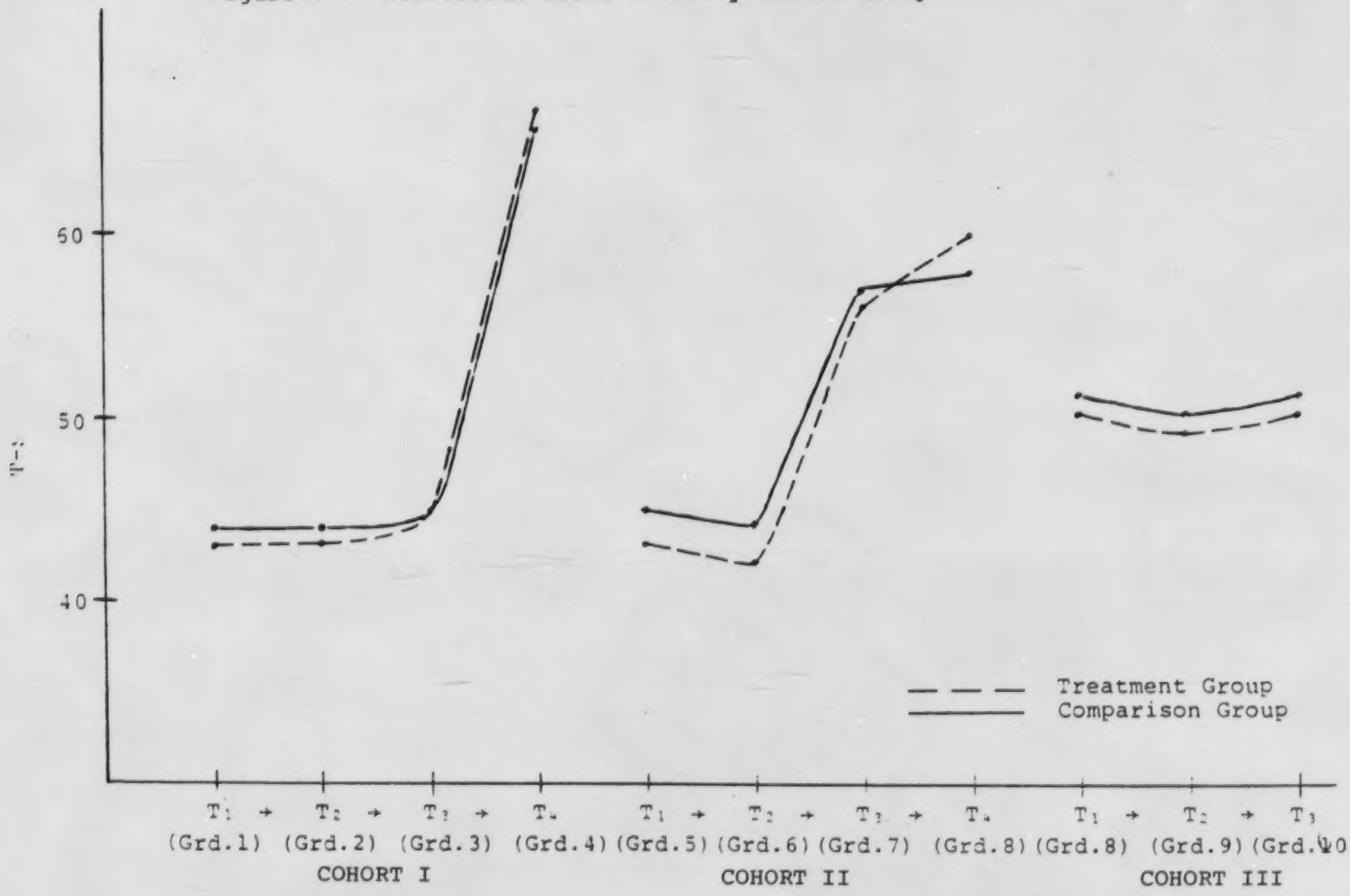


Figure 7 : Motivation Trend Lines by Cohort Group


60
50
40
T1 → T2 → T3 → T4 T1 → T2 → T3 → T4 T1 → T2 → T3
(Grd.1) (Grd.2) (Grd.3) (Grd.4) (Grd.5) (Grd.6) (Grd.7) (Grd.8) (Grd.8) (Grd.9) (Grd.10)
COHORT I
COHORT II
COHORT III
Treatment Group
Comparison Group

remained at a constant level for years 1, 2, and 3, and increased dramatically at year 4, while the mean motivation score of females in this group increased steadily through years 1, 2, and 3, then increased dramatically and slightly surpassed males at year 4. On the other hand, males and females in the comparison group performed identically at years 1, 2, and 3, but while both increased markedly at year 4, the males slightly surpassed the females. (The motivation trends are illustrated in Figure 7.)

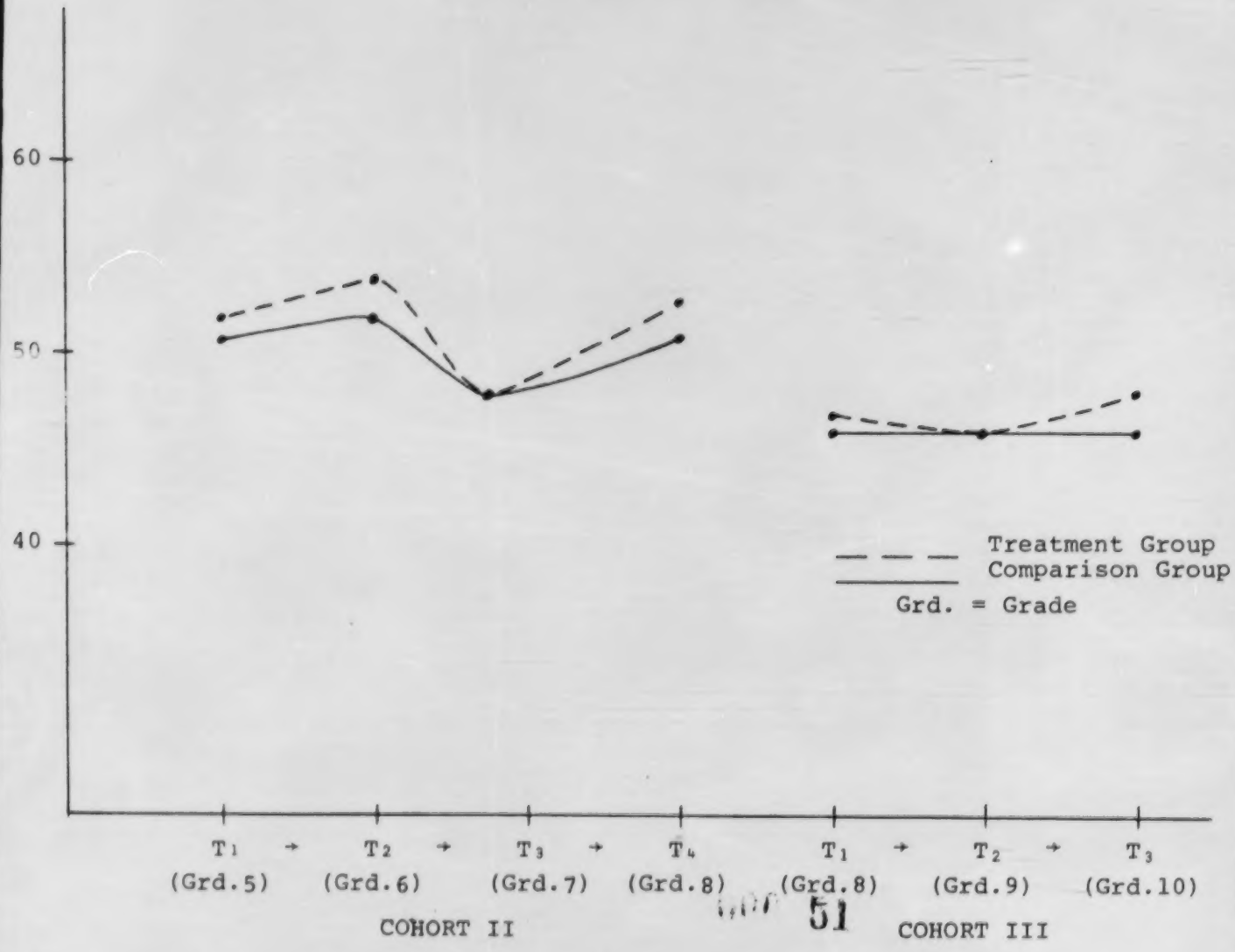
Cohort II consisted of students in grade 5 at the time the treatment program was initiated and tracked through grade 7. Five affective variables were examined: self concept, motivation, achievement attitude, affiliation attitude, and inclusion attitude. A test form change occurred on the measures of self concept and motivation between grades 6 and 7; no form changes occurred for the attitude measures.

Neither significant group nor sex main effects, nor interaction effects were present for any of these five affective variables for Cohort II. Significant year main effects ($p<.001$) were present for all affective variables. In the case of self concept and motivation, there was also a significant year and group interaction effect ($p<.01$ and $p<.02$, respectively), and in the case of achievement attitude, there was a significant year and sex interaction effect ($p<.02$). (See Figure 8.)

For the variables of self concept and motivation, the significant effect was associated with the marked increase in mean scores between years 2 and 3. This increase may have been due to a change attendant upon a shift from elementary to middle school or could have been an artifact of the instrument, with a form change between grades 6 and 7. The year and group interaction effect for these variables was attributable to the small treatment group drop in mean T-score at year 4, while students in the comparison group continued to increase their scores slightly that year.

With respect to achievement attitude, the year effect stemmed from the slightly depressed mean score at year 3 relative to years 1, 2, and 4. This depressed score may have been attributable to expectations of greater school work demands associated with entry into middle school. The year and sex interaction effect was attributed to the fact that males had a higher mean T-score than females on years 1 and 2, while females overtook males on year 3 and increased their margin of higher achievement attitude on year 4. At year 4, males actually had a lower mean T-score than they did at year 1, while females had a noticeably higher mean score at year 4 than at year 1. This shift in achievement attitude may have been due to the greater pressures to achieve that males experienced during the high school years.

Figure 8: Achievement Attitude Trend Lines by Cohort Group



The year main effect for Cohort II affiliation attitude stemmed from the slight mean T-score increases from year 1 to 2, slight decreases at year 3, and a noticeable drop at year 4. This trend could have been due to the transitory nature of a two year middle school setting which provided a context for lowered affiliation attitudes. For inclusion attitude, the year main effect seemed due to the noticeable increase in mean score between years 1 and 2, with a plateau effect over years 2, 3, and 4. (Affiliation attitude trends are shown in Figure 9, inclusion attitudes in Figure 10.)

Cohort III consisted of students in grade 8 at the time the treatment program was begun and tracked through grade 10. This cohort group was examined on the same affective variables reported for Cohort II, using the same statistical procedures.

For self concept and motivation, the only significant statistical effect present was a sex main effect on motivation. The nature of this effect was that females consistently attained higher mean motivation T-scores than males.

On Cohort III achievement attitude, no significant statistical effects of any kind were present. On affiliation attitude, there was only one statistically significant effect present and that was a three-way interaction effect for year, group, and sex ($p<.03$). This occurred because in the treatment group, males started out with a higher mean score than females, with both males and females showing slight increases in mean scores through years 2 and 3. In the comparison group, on the other hand, females started out slightly higher than males and remained so through year 2. At year 3, females showed a decrease in mean score while males showed a marked increase.

There was also one significant main effect for year on inclusion attitude ($p<.02$). This was due to the increase in the mean T-score between years 1 and 2, while the mean T-score for years 2 and 3 were identical.

Cognitive Variables

Cohort I, comprised of students in grade 1 in the first year of the treatment program and in grade 4 in the final year of this study, was examined via two sets of analyses of the achievement data. Only language and arithmetic achievement scores are available from the TOBE, used for grade 1. These two variables, then, were analyzed across all four years of the cohort group.

The cognitive variables of language, reading, arithmetic, total achievement, and study skills are present in the CTBS/Q used for grades 2 through 4. All five of these were analyzed in the years 2 to 4 studies of achievement. As with self

Figure 9 : Affiliation Attitude Trend Lines by Cohort Group

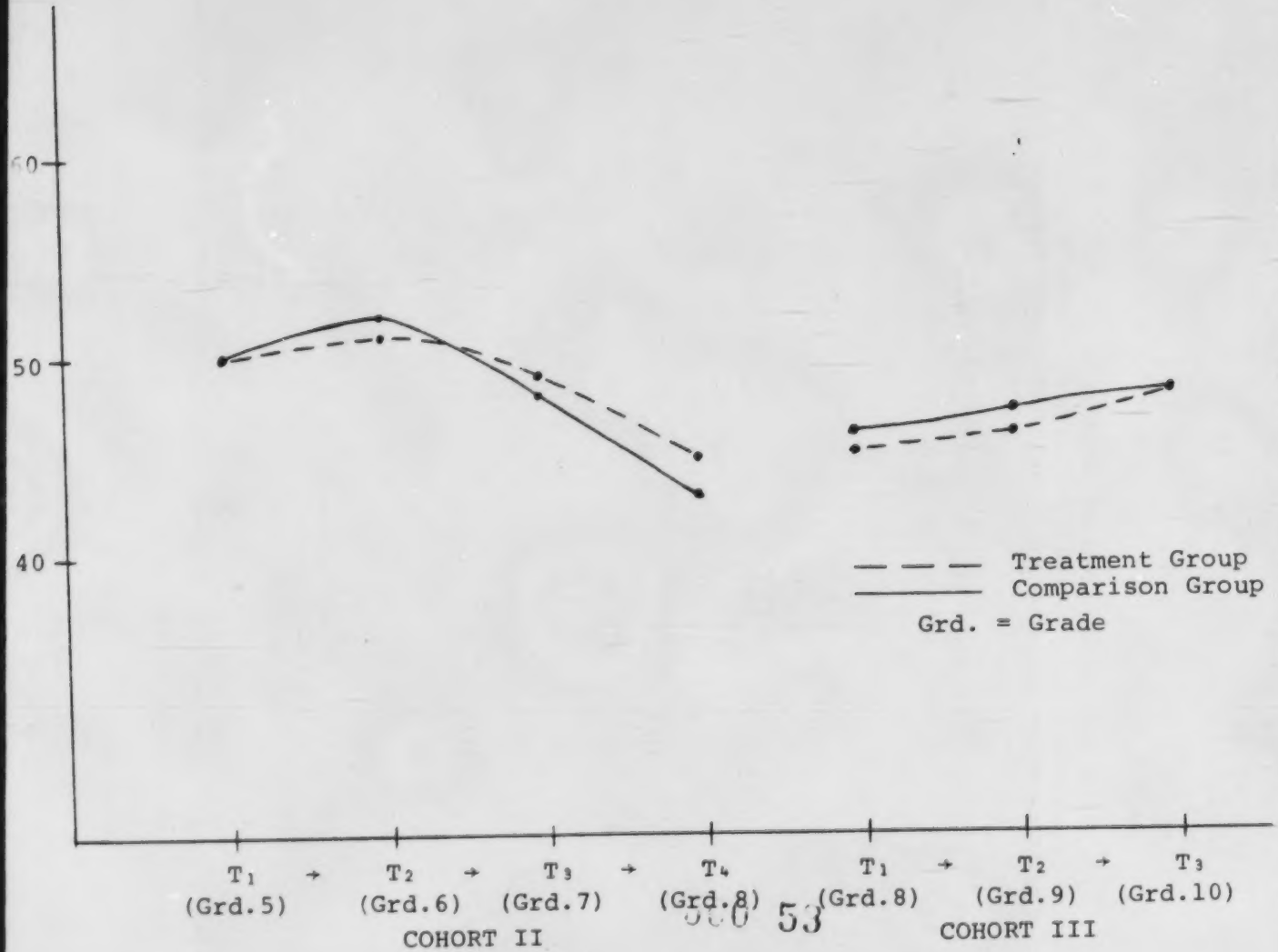
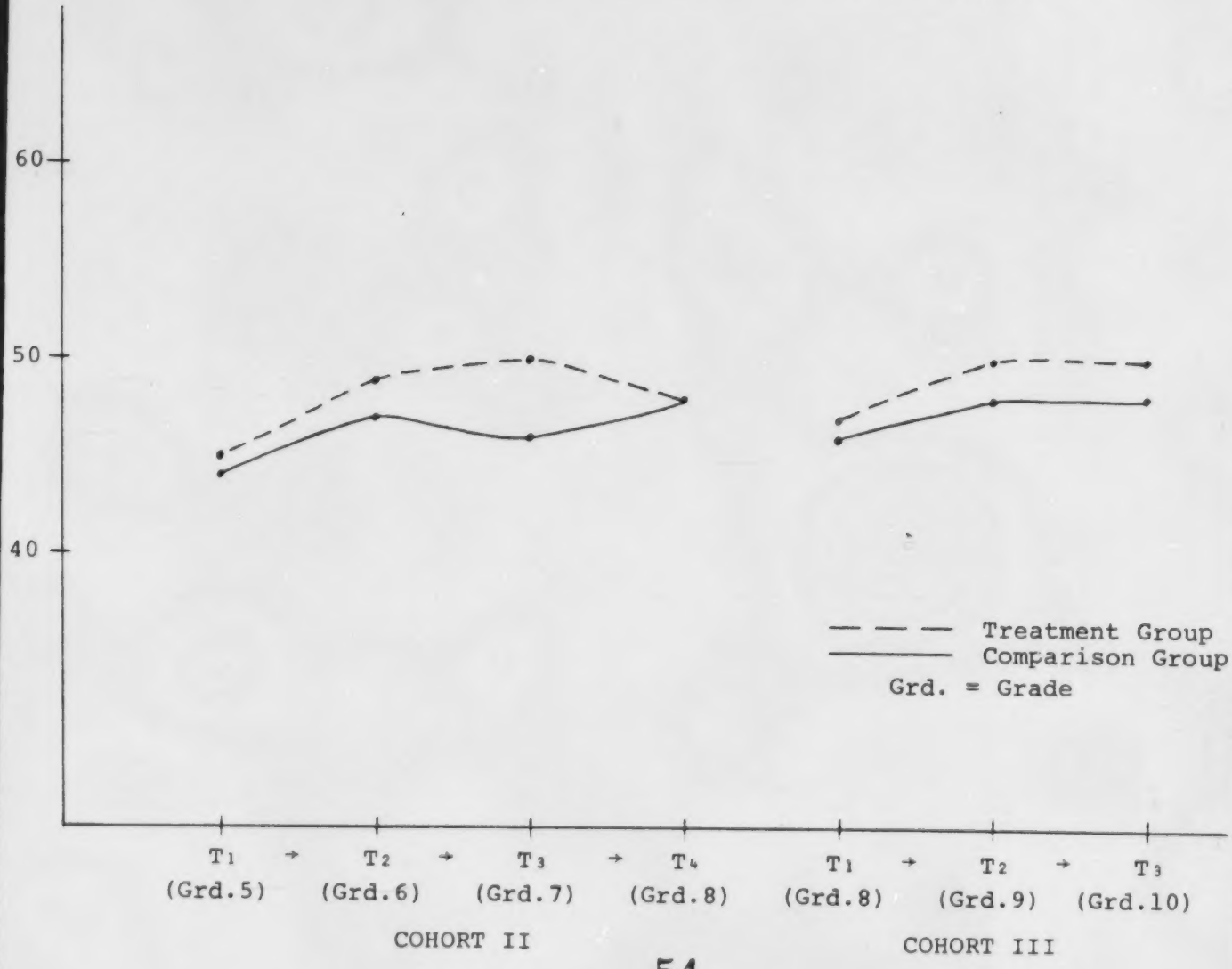


Figure 10: Inclusion Attitude Trend Lines by Cohort Group



concept and motivation, the cognitive variables raw scores were converted to T-scores prior to the repeated measures analysis.

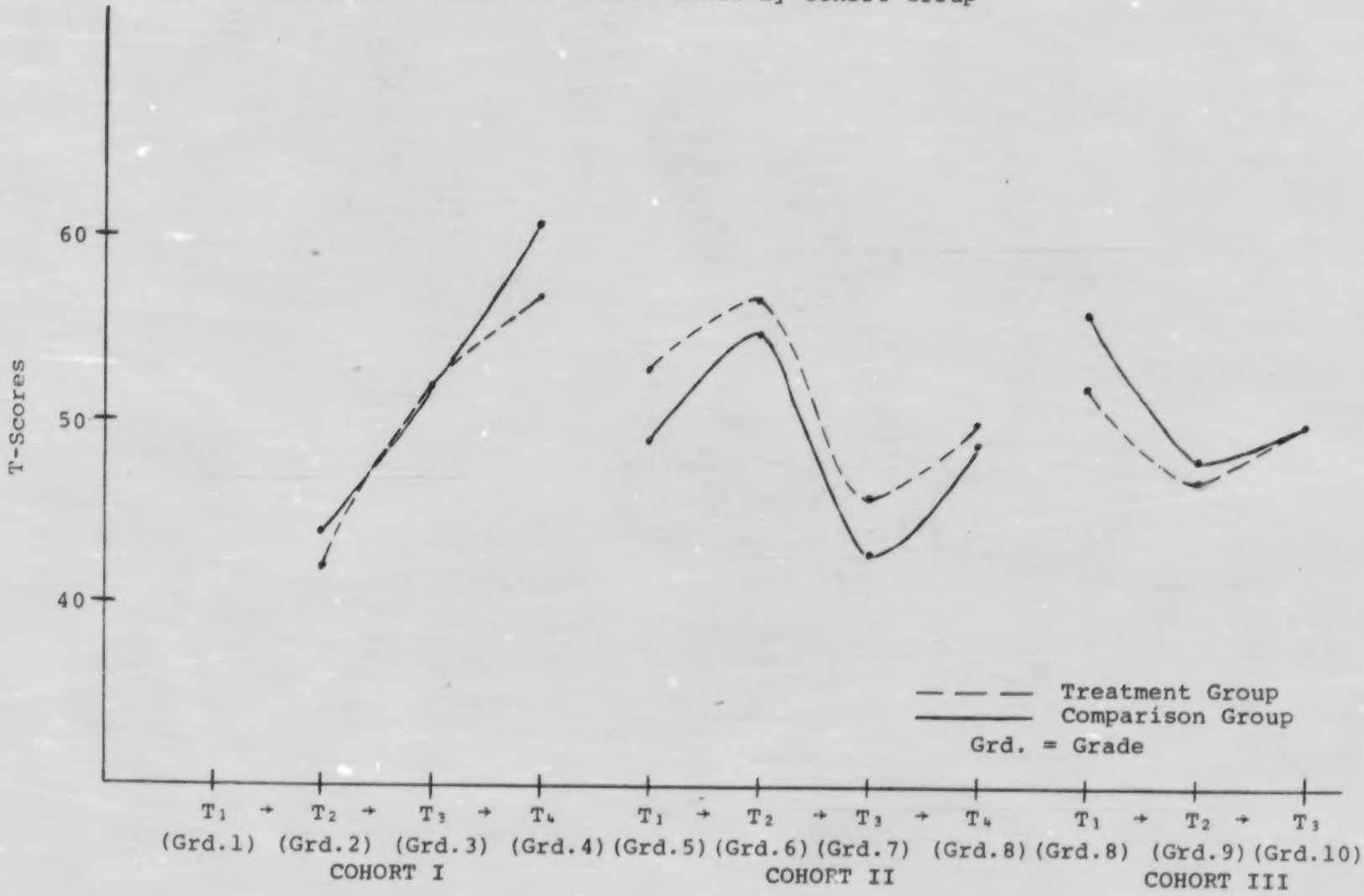
The language achievement variable was particularly sensitive in the case of Cohort I. There were main effects for group ($p<.02$), sex ($p<.05$), and year ($p<.001$), as well as year and group ($p<.001$), and year and sex ($p<.001$) interaction effects. Interestingly, the group main effect was in the opposite direction from that predicted by the treatment model; that is, the mean T-scores of students in the comparison group became progressively and significantly higher than the mean T-scores of students in the treatment group from years 1 to 4. The nature of the sex main effect was that females attained significantly higher mean scores than did males with the differences becoming particularly pronounced at years 3 and 4. As could be inferred from the foregoing discussion, the year main effects derived from the students attaining progressively higher mean scores across years with the most pronounced increase occurring between years 2 and 3.

Inspection of the means revealed that the year and group interaction effect was because treatment and comparison group students started with identical mean scores at year 1 but the students in the comparison group increased their mean scores across years more dramatically. Likewise, the year and sex interaction effect derived from females attaining higher increases in mean scores than the males from each year to the next.

For each of the remaining Cohort I cognitive variables, the only significant effect present was a main effect for year ($p<.001$). In the case of reading, total achievement, and study skills, where measures were available only for grades 2 through 4, this main effect took the form of progressive increases in mean scores from years 2 through 4. For arithmetic, the year main effect was demonstrated by a progressive increase in mean achievement scores from year 1 to 4 with the highest increases occurring between years 1 and 2, and years 2 and 3. (The total achievement trends are shown in Figure 11.)

Cohort II, composed of students in grade 5 when the treatment program was started and tracked through grade 7, was also examined with respect to the same cognitive variables treated for Cohort I. The repeated measures ANOVA revealed that the only significant effect present in the case of each variable was a main effect for year ($p<.001$). Examination of the means also revealed that the nature of the year effect was identical in each case. The mean T-scores of students increased from year 1 to 2, then decreased appreciably from year 2 to 3, with slight to appreciable increases from year 3 to 4. While it is possible that the decrease in cognitive achievement from years 2 to 3 may have been due to the adjustment required as students

Figure 11: Total Achievement Trend Lines by Cohort Group



made the transition from an elementary to a middle school setting, it is more likely that it was an artifact of the instrument, with a form change between grades 6 and 7.

Cohort group III, consisting of students in grade 8 at the beginning of the treatment program and tracked through grade 10, was examined with respect to the same cognitive variables reported for the previous two cohort groups. A test form change for these variables occurred between grades 8 and 9.

The repeated measures analyses on the Cohort III achievement variables indicated that, with the exception of arithmetic, where a significant year and group interaction effect ($p<.02$) was present, the only significant effect in each case was a main effect for year: language ($p<.04$), reading ($p<.001$), arithmetic ($p<.001$), total achievement ($p<.001$), and study skills ($p<.02$). The year effect was identical for each of the cognitive variables. The mean achievement T-score of students decreased from year 1 to 2 and then rose slightly from years 2 to 3, but failed to reach and/or surpass the original mean T-score. As in the case of Cohort II, this phenomenon may have been due to the adjustment required as students made the transition from one school setting to another, in this case, from middle to high school. Or as previously noted, it may also have been due in part or whole to an instrument form change between grades 8 and 9. The year and group interaction effect present for arithmetic was due to students in the treatment group increasing their mean scores slightly between years 2 and 3, while those in the comparison group attained identical mean scores for these years.

Summary: Repeated Measures Analyses/Longitudinal Subsamples

When all three groups of cohort students sampled in this study were examined with respect to the affective variables of self concept, motivation, and achievement, affiliation, and inclusion attitude, no significant group effects were found. That is, regardless of grade level at entry into the program, the data did not demonstrate a measurable impact of the treatment program in enhancing the psychosocial growth of students.

When data on the cognitive variables investigated in this study were reviewed for all three cohort groups, only one significant group main effect was present. This occurred on the language achievement test of Cohort I. However, the group difference was not in the direction predicted by the treatment model - the comparison group achieved significantly higher mean T-scores on language than the treatment group. The conclusion was that the treatment program had apparently not produced its intended outcome of significantly improving the cognitive performance of its participants relative to non-participants.

Summary for Research Question Two

More than half the significant differences found in the large cell size annual analyses of the affective variables were due to sex; the others were inconsistent in pattern. Few differences were found in the non-mobile longitudinal subsample students' affect scores and all but one were due to sex. No affective score differences were present when these subsample scores were examined over the three or four years of the cohort groups. Cognitive differences were more numerous but followed the same pattern as the affective: most of the differences were due to sex. An exception to these general statements was grade 4 where consistent achievement differences persisted, whether examined cross sectionally or via the repeated measures over time. These differences were due to the comparison students scoring higher than those of the treatment group. Most importantly the trend lines for all variables were remarkably similar for both the treatment and comparison groups.

Research Question Three: Influence of Affective Variables on Cognitive Performance

The Edgewood experimental program document specifically stated that the affective attributes of Mexican American students are related to their level of cognitive performance. If this basic assumption of the treatment were valid, that is, that improvement in the affective domain would result in concomitant improvement in the cognitive domain, the relationship between them could be determined.

The primary procedure for this determination was multiple regression with stepwise inclusion, calculated separately for boys and girls since a number of sex differences had been found in the previous analyses. Table 2 contains the regression coefficients (R square changes and explained variance) for language and arithmetic achievement at first grade and for total achievement at the others. In each case the procedure entered the affective variables into the equation according to the magnitude of their zero order correlations. Although all of the correlations were significant ($p<.05$), and a few of the correlations were high enough to be important, their occurrence was sporadic and no consistent pattern could be ascertained. Most of the correlations were so low as to be of little or no practical use as predictions. Separate analyses regressing each of the achievement subtest scores against the affective variables produced similar results.

A second set of regression equations used the scores of both sexes to regress total achievement against the achievement subtest scores. Again, there was no consistent pattern. Following the recommendations of Weinstein (83), a combination

Table 2: Changes in Regression Coefficients of Affective Variables to Achievement, Grades 1-10 Longitudinal Subsamples

Variable/Sex		Grade/Test/R^2 Change										
		1		2	3	4	5	6	7	8	9	10
		Lang	Arith	TotAch	TotAch	TotAch	TotAch	TotAch	TotAch	TotAch	TotAch	TotAch
Motivation	M	.071	.017	.014	.023	.026	.016	.039	.001	.000	.006	.031
	F	.218	.001	.039	.000	.019	.001	.006	.126	.037	.112	.168
Self Concept	M	.005	.001	.001	.003	.002	.003	.000	.012	.187	.012	.003
	F	.000	.006	.004	.000	.000	.027	.001	.003	.035	.001	.000
Ach. Attitude	M	na	na	na	na	.151	.009	.008	.018	.007	.029	.222
	F	na	na	na	na	.063	.001	.000	.000	.004	.038	.007
Aff. Attitude	M	na	na	na	na	.114	.007	.005	.044	.026	.001	.002
	F	na	na	na	na	.033	.039	.073	.000	.022	.009	.036
Incl. Attitude	M	na	na	na	na	.069	.103	.002	.075	.010	.004	.017
	F	na	na	na	na	.004	.104	.002	.017	.045	.001	.030
Explained Variance (R^2)	M	.076	.018	.014	.026	.362	.138	.055	.150	.230	.053	.276
	F	.218	.007	.043	.000	.119	.173	.082	.147	.144	.161	.241

approach was also used with sex entered first in the equation and the affective variables entered stepwise according to their zero order correlations thereafter. No pattern could be ascertained and the R^2 changes remained very low.

The final analysis was to determine whether the two sets of variables, affective and cognitive, were related. The canonical correlation procedure was used, examining the sets for each year of the three cohorts and without regard to sex.* The means and standard deviations for each of the measures was well within the limits expected for these subsamples. The product moment correlations among the affective variables were also as would be expected with the three attitude measures were at about .90, the correlations between self concept and motivation were at about .50, and those among all the affective measures were at about .20. The correlation between language and reading, in the achievement variables, was nearly .80, and of these two with arithmetic approximated .50.

The zero order product moment correlations among the cognitive and affective measures were very low, ranging from .05 to .27, with only five of the fifteen correlations larger than .20. Nine roots were calculated in each of the canonical correlation analyses with the exception of grades 1, 2, and 3, where both the affective and the cognitive measures were reduced in number. Only three roots, in all the calculations, indicated a significant ($p<.05$) canonical correlation. Only 15 to 16% of the cognitive variable scores were attributable to the affective measures; only 5% of the affective variables were attributable to the cognitive variables.

The R squared values between each cognitive variable and all of the affective variables, and vice versa, were also calculated. These values ranged from .01 to .23 and the average (using Fisher's Z score transformation) was approximately .10. The conclusion from these analyses, then, was that there were no significant canonical, linear, or zero order correlations among the affective and cognitive measures for these samples.

Summary for Research Question Three

Regardless of the procedure used, whether multiple regression or canonical correlation analysis, the affective variables, singly or as a set, were not significantly correlated with

*The canonical correlation analyses and the discussion of the results were prepared by Dr. Michael Yost, Jr., of Trinity University, San Antonio, Texas.

the cognitive variables singly or as a set nor with the total achievement alone. The few sporadic and inconsistent findings, when viewed across years, were of no importance.*

It is important to note that while sex emerged as an important variable in the ANOVAs, it accounted for virtually no variance in achievement in the regressions. This appeared to suggest that while sex was an important differentiating variable in achievement, it was not a viable one for predicting achievement when in consort with the affective variables. These data also indicated that within the parameters of this study, there was no empirical foundation for the commonly held assumptions that the affective variables of motivation, self concept, and attitudes are predictive of achievement in Mexican Americans.

CONCLUSIONS AND IMPLICATIONS

The findings of this study suggested several major implications of immediate concern to educational practitioners regarding prevailing assumptions of the importance of affective variables in current educational processes. Additionally, several suggestions for future research evolved.

As previously noted, the assumption that Mexican American students, as a group, reflect low and/or negative affective traits was not supported by this study. To the contrary, the data revealed that these Mexican American students generally scored at or well above the norm in self concept and at the norm on the attitude constructs of achievement, inclusion, and affiliation, as well as on motivation in the later elementary grades. The data also revealed that the sample students scored below the norm on achievement. Both these conclusions are consistent with most of the recent research in these areas. Nevertheless, the assumption that Mexican Americans have low self concept and attitudes appears to prevail as evidenced by its continued use as a rationale in local education agency proposals for compensatory and bilingual-bicultural program funding. A critical reexamination of this assumption by educators is clearly warranted.

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*Similarly, in a correlative study of the predictiveness of the Purdue Social Attitude Scale scores on K-3 achievement scores, Jones (43) found negligible relationships between these two variables in samples from the same district and schools.

With respect to the findings of the impact of a large scale educational program intended to increase achievement by including focus on the affective domain, several implications are noteworthy: First, an educational change program predicated on the so called "theory of incompatibilities," at least as operationalized by the treatment program, appeared ineffective in promoting either the psychosocial or the cognitive growth of Mexican American students. It is important to note that the theory of incompatibilities, on which the original funding document was based, was only partially operationalized in the treatment program, particularly with regard to treatment implementation. Consequently, because of what appeared to be weak translation into practice, the theory may not have been completely tested. The fact remains, however, that great amounts of time and other resources were devoted to various treatments that did not produce the proposed changes. The result was that the life chances of the Mexican American students participating in the treatment program were no better than for those who did not receive the treatment. It appears warranted to emphasize that a great deal more care must be given to determining those aspects of the school environment which are likely to promote psychosocial and, especially, cognitive growth of Mexican American students before other massive educational efforts are undertaken.

Second, and related to the first, the simultaneous occurrence of depressed cognitive achievement and the introduction of a treatment such as an individualized instruction program initiated in 1975-1976, suggested the need to carefully examine the effects of the type of educational structure represented by the specific treatment and the possible effects of the quantity of changes on Mexican American school performance. In a previously cited study, Evans & Anderson (34) suggested that lower class Mexican American students may respond best to a structured educational environment. It may be, then, that the relative freer structure represented by the individualized program had deleterious effects on the performance of some of the treatment students vis-a-vis their counterparts operating in the more conventionally structured comparison schools.

It is necessary to suggest, however, that the apparent losses suffered by the treatment group at grade four may have been temporarily caused by the need for both teachers and students to adjust to a new instructional system and that these losses might have been recouped after the initial adjustment period.* If this were true, then other positive advantages accruing

*The experimental programs in eighth and tenth grades, also included in the 1975-1976 analyses, were modified only slightly. The only grade included in the study that experienced substantial program modification was fourth grade.

from the individualized program might justify the temporary setback. On the basis of the grade four findings, however, additional research investigating the effects of individualized instruction techniques on the academic performance of lower class Mexican American students must be regarded as imperative. When a group of students begins educational training at a position of relative disadvantage, it is imperative that no miscalculation in the effectiveness of educational techniques contribute to furthering that disadvantage. On the contrary, it is incumbent on the educational system to insure that group disadvantages are minimized so that individual potentials may be fulfilled.

Third, the finding that the largest number of significant effects detected occurred at grades 3 through 6, and that these were primarily sex differences, suggested that this may be a critical developmental period for Mexican American students. Further empirical research attention to this possibility appears warranted as does further investigation into ascertaining the reasons for higher performance on the part of Mexican American females as compared to males. One possibility, which merits further attention, is Evans & Anderson's (34) suggestion that higher female performance is attributable to differential independence training for males and females in lower socioeconomic Mexican American families.

Fourth, cognitive performance of Mexican Americans seemed to be affected little by the type of affective variables investigated in this study. On the other hand, the apparent sensitivity of academic performance to cognitive climate, as evidenced at grade 4, suggested that this might be the aspect of the school environment which should be addressed if improvement of cognitive performance is desired. While this is not meant to minimize the importance of affective variables for the mental health and wellbeing of students, it is suggested that since academic achievement is a key factor in social mobility, the most effective way to enhance academic performance and social mobility is to concentrate on improving cognitive aspects of the school program.

The findings of this study suggested that affective climate may be a necessary but insufficient causal factor in school achievement, or that it may be desirable but neither necessary nor sufficient with respect to school achievement. In either event, if the sole intent is to improve scholastic performance, it would seem that resources should be concentrated on improving cognitive instructional delivery services. Such a possibility should be give careful consideration.

Another interesting finding from the Cohort I analyses was that sex, treated in this study as a control variable, emerged as a significant factor at grades 3 and 4 with respect to several cognitive variables. On each of these, females obtained significantly higher mean scores than males. If findings based on this sample can be generalized, this may indicate that although male and female pupils are intellectually similar in the early primary grades, sex differentiation becomes significant as they progress through school. The question of differential academic achievement by sex and the type of program most favorable to each thus merits increased attention for educational researchers and practitioners.

Last, since the affective variables, either independently or jointly, correlated at negligible levels with achievement, additional evidence emerged that other factors may be critical to enhancing school performance. Indeed, it would appear that if significant progress is to be made in increasing the academic performance of Mexican Americans, the identification of the salient variables related to promoting achievement merits priority. In the interim, it may well be that the educational interests of Mexican American students will best be served by focusing resources on improving the quality of academic programs.

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APPENDIX A

Summary Tables of Major Test Data

Appendix A1: Comparison of Mean Scores for the Cross Sectional Samples and Longitudinal Subsamples: All Students

Test/Samples**	Grade/Mean Score*									
	1	2	3	4	5	6	7	8	9	10
Motivation										
Cross	46	48	49	99	98	95	121	126	124	125
Long	44	45	45	98	99	96	122	128	124	126
Self Concept										
Cross	45	46	45	88	89	85	110	109	107	108
Long	45	45	45	88	88	85	111	109	107	108
Ach. Attitude										
Cross	na	na	na	51	51	52	48	47	46	46
Long	na	na	na	51	52	52	48	47	46	48
Aff. Attitude										
Cross	na	na	na	50	50	51	49	45	46	47
Long	na	na	na	51	50	51	49	45	47	48
Incl. Attitude										
Cross	na	na	na	45	44	47	48	45	49	48
Long	na	na	na	44	44	48	49	47	50	49
Reading										
Cross	na	23	32	41	37	40	30	37	35	41
Long	na	23	33	42	37	42	30	40	35	43
Language										
Cross	19	25	38	44	38	42	33	39	38	41
Long	19	26	38	45	39	43	32	43	41	43
Arithmetic										
Cross	18	35	53	62	51	57	36	47	42	45
Long	18	36	53	62	52	58	36	49	44	47
Total Achieve.										
Cross	na	85	126	152	126	140	102	122	119	132
Long	na	86	126	152	129	146	103	133	121	136

*All means expressed in whole numbers to facilitate scanning.
**Cross sectional samples; longitudinal subsamples.

Appendix A2: Cohort I Cross Sectional Test Data by Groups*

Variable	Grd 1 (T_1) N	$\bar{X}$	sd	S9	ΣS9	Grd 2 (T_2) N	$\bar{X}$	sd	S9	ΣS9	Grd 3 (T_3) N	$\bar{X}$	sd	S9	ΣS9	Grd 4 (T_4) N	$\bar{X}$	sd	S9	ΣS9
MOTIVATION	358	46.48	8.36	3	3	251	47.97	4.82	4	4	235	48.77	4.71	5	5	280	99.39	5.40	6	6
	108	45.73	5.31	3		72	49.11	4.49	5		60	48.62	3.51	5		156	99.08	7.90	6	
SELF-CONCEPT	358	44.68	7.22	5	5	251	46.00	5.65	5	5	235	44.83	4.56	6	6	279	87.48	9.54	6	6
	108	45.46	6.23	5		72	45.83	6.30	5		60	45.42	5.05	6		156	88.48	11.84	6	
READING	na					219	22.88	9.15	4	4	223	32.38	15.00	4	4	230	39.99	18.88	3	3
						70	23.97	8.93	4		61	32.79	15.04	4		142	42.83	17.38	3	
LANGUAGE	301	19.10	4.83	3	3	216	24.48	9.78	4	4	222	36.56	16.43	3	3	228	42.53	18.67	3	3
	97	18.55	4.97	3		70	26.63	11.82	4		50	40.30	15.23	4		141	47.79	17.84	3	
ARITHMETIC	192	17.80	3.85	3	3	192	34.69	12.55	4	4	223	54.41	22.28	4	4	224	59.57	25.00	3	3
	61	17.00	4.48	3		66	36.55	14.00	5		57	50.81	17.92	4		137	65.10	23.24	3	
TOTAL ACHIEVEMENT	na					189	83.36	25.13	4	4	221	124.57	49.12	3	3	222	147.88	56.38	2	2
						64	87.42	30.91	4		48	128.46	44.21	3		135	161.29	52.96	3	
STUDY SKILLS	na					202	9.26	3.72	4	4	223	11.81	5.10	4	4	227	14.06	6.10	3	3
						68	8.91	3.67	4		58	13.41	5.28	4		141	15.62	6.08	3	
																N	T-Sc	sd	Norm	
ACHIEVEMENT ATTITUDE	na					na					na					244	51	6	50	
																118	51	8	50	
AFFILIATION ATTITUDE	na					na					na					244	50	6	50	
																118	50	7	50	
INCLUSION ATTITUDE	na					na					na					244	45	5	50	
																118	44	5	50	

*There are two sets of data for each variable: the treatment group data are in the upper row; comparison are in the lower row.

▮=Test form change

na=not applicable

ΣS9=pooled stanine

Appendix A3: Cohort II Cross Sectional Test Data by Groups*

Variable	Grd 5 (T_1)					Grd 6 (T_2)					Grd 7 (T_3)				
	N	$\bar{X}$	sd	S9	ΣS9	N	$\bar{X}$	sd	S9	ΣS9	N	$\bar{X}$	sd	S9	ΣS9
MOTIVATION	350	98.73	8.22	5	5	287	95.52	8.83	4	4	203	122.49	13.71	4	4
	128	97.32	6.81	5		167	95.31	8.60	4		85	121.25	10.95	4	
SELF-CONCEPT	350	87.92	10.87	6	6	287	84.54	11.15	6	6	203	110.79	13.87	5	5
	128	92.63	17.06	7		167	86.21	9.28	6		85	109.17	8.69	5	
READING	259	36.59	14.20	3	3	278	40.88	15.18	3	3	187	29.82	11.89	3	3
	119	36.92	13.69	3		183	39.74	15.79	3		79	31.35	12.83	3	
LANGUAGE	258	38.14	15.21	3	3	278	41.71	16.60	3	3	186	31.55	12.70	3	3
	118	37.74	15.68	3		182	43.31	16.52	3		79	34.84	15.30	3	
ARITHMETIC	262	51.80	16.70	3	3	278	56.24	16.76	3	3	193	35.85	10.59	3	3
	122	49.16	15.72	3		182	57.20	17.81	3		75	36.93	12.30	3	
TOTAL ACHIEVEMENT	251	126.88	42.59	3	3	261	140.17	44.54	3	3	182	101.47	37.88	2	2
	117	124.02	41.81	3		174	141.36	47.03	3		74	104.38	36.53	3	
STUDY SKILLS	260	19.74	7.51	3	3	275	22.95	9.29	3	3	193	17.58	7.67	3	3
	122	19.43	7.00	3		180	22.59	9.61	3		73	20.00	8.29	3	
	N	T-Sc	sd	Norm		N	T-Sc	sd	Norm		N	T-Sc	sd	Norm	
ACHIEVEMENT ATTITUDE	322	51	6	50		249	51	7	50		182	48	7	50	
	118	51	6	50		158	53	7	50		73	47	6	50	
AFFILIATION ATTITUDE	322	49	6	50		249	50	7	50		182	49	7	50	
	118	50	6	50		158	52	7	50		73	48	5	50	
INCLUSION ATTITUDE	322	44	6	50		249	47	7	50		182	49	6	50	
	118	44	6	50		158	48	6	50		73	47	6	50	

*There are two sets of data for each variable: the treatment group data are in the upper row; comparison are in the lower row.

■ =Test form change.

ΣS9=Pooled stanine.

Appendix A4: Cohort III Cross Sectional Test Data by Groups*

Variable	Grd 8 (T_1)					Grd 9 (T_2)					Grd 10 (T_3)				
	N	$\bar{X}$	sd	S9	ΣS9	N	$\bar{X}$	sd	S9	ΣS9	N	$\bar{X}$	sd	S9	ΣS9
MOTIVATION	277	126.89	12.53	4	4	88	123.58	17.99	4	4	63	126.56	17.77	4	4
	122	124.66	10.68	4		47	123.28	13.22	4		64	123.73	11.91	4	
SELF-CONCEPT	277	108.42	12.12	5	5	87	106.41	15.93	5	5	63	107.86	11.51	5	5
	122	108.98	10.59	5		46	107.65	9.57	5		64	107.50	12.27	5	
READING	235	36.49	14.26	3	3	87	34.93	11.44	3	3	54	42.32	12.64	3	3
	90	36.56	13.59	3		77	32.12	11.98	3		63	36.94	14.47	3	
LANGUAGE	235	38.42	14.70	3	3	87	39.71	11.59	3	3	54	43.32	11.53	3	3
	90	39.03	13.24	3		77	35.86	12.39	3		63	38.08	13.08	3	
ARITHMETIC	234	45.43	15.68	3	3	82	42.01	13.59	3	3	55	46.15	16.69	3	3
	90	48.99	17.52	3		78	37.76	13.36	3		61	41.93	16.03	3	
TOTAL ACHIEVEMENT	223	120.89	40.27	3	3	82	122.60	31.35	3	3	52	133.65	33.87	3	3
	90	124.59	40.27	3		75	107.00	33.81	2		60	117.93	39.35	2	
STUDY SKILLS	234	22.65	8.59	3	3	82	22.87	8.37	3	3	55	26.62	11.09	3	3
	90	22.42	8.58	3		79	19.89	6.63	3		60	21.87	7.71	3	
	N	T-Sc	sd	Norm		N	T-Sc	sd	Norm		N	T-Sc	sd	Norm	
ACHIEVEMENT ATTITUDE	245	47	8	50		94	46	8	50		53	47	7	50	
	117	46	6	50		50	46	7	50		63	45	7	50	
AFFILIATION ATTITUDE	245	45	7	50		94	47	7	50		53	47	6	50	
	117	46	6	50		50	47	6	50		63	47	7	50	
INCLUSION ATTITUDE	245	45	6	50		94	49	6	50		53	49	5	50	
	117	44	5	50		50	48	5	50		63	47	5	50	

*There are two sets of data for each variable: the treatment group data are in the upper row; comparison are in the lower row.

▮ =Test form change.

ΣS9=Pooled stanine.

APPENDIX B

Tables for the Cross Sectional Analyses of the Cross Sectional Samples

Appendix B1: Summary of Analyses of Variance: Grade 4, Cross Sectional, Affective Variables

Variable	Source	df	MS	F Value	p
Inclusion	Sex	1	66.62	2.856	NS
	Group	1	110.88	4.753	.028
	Interaction	1	0.54	.023	NS
	Residual	368	23.33		

Variable	Sex	Trmt Grp $\bar{X}$	N	Comp Grp $\bar{X}$	N	Total $\bar{X}$	N
Inclusion	M	44.42	116	42.87	76	43.81	192
	F	45.47	128	44.08	52	45.07	180

Appendix B2: Summary of Analyses of Variance: Grade 5, Cross Sectional, Affective Variables

Variable	Source	df	MS	F Value	p
Motivation	Sex	1	836.87	14.060	.001
	Group	1	121.66	2.044	NS
	Interaction	1	4.12	.069	NS
	Residual	474	59.52		
Inclusion	Sex	1	241.26	7.421	.007
	Group	1	7.78	.239	NS
	Interaction	1	.02	.001	NS
	Residual	436	32.51		

Variable	Sex	Trmt Grp $\bar{X}$	N	Comp Grp $\bar{X}$	N	Total $\bar{X}$	N
Motivation	M	97.09	165	95.42	59	96.66	224
	F	100.19	185	98.94	69	99.85	254
Inclusion	M	42.95	159	43.39	54	43.06	213
	F	44.68	163	45.09	64	44.79	227

Appendix B3: Summary of Analyses of Variance: Grade 6, Cross Sectional, Affective Variables

Variable	Source	df	MS	F Value	p
Motivation	Sex	1	319.39	4.218	.038
	Group	1	.08	.001	NS
	Interaction	1	3.57	.047	NS
	Residual	450	75.81		
Achievement Attitude	Sex	1	183.75	3.706	NS
	Group	1	3.36	.068	NS
	Interaction	1	339.60	6.848	.009
	Residual	403	49.59		
Affiliation	Sex	1	107.95	2.432	NS
	Group	1	7.61	.171	NS
	Interaction	1	209.76	4.725	.029
	Residual	403	44.39		
Inclusion	Sex	1	162.95	3.882	.047
	Group	1	8.89	.212	NS
	Interaction	1	44.79	1.067	NS
	Residual	403	41.98		

		Trmt		Comp		Total	
Variable	Sex	Grp $\bar{X}$	N	Grp $\bar{X}$	N	$\bar{X}$	N
Motivation	M	94.38	132	94.34	74	94.36	206
	F	96.49	155	96.09	93	96.34	248
Achievement Attitude	M	51.88	117	51.61	74	51.77	191
	F	50.16	132	53.64	84	51.51	216
Affiliation	M	51.08	117	51.49	74	51.24	191
	F	49.76	132	53.12	84	51.09	216
Inclusion	M	46.47	117	46.03	74	46.30	191
	F	48.09	132	49.01	84	48.45	216

Appendix B4: Summary of Analyses of Variance: Grade 8, Cross Sectional, Affective Variables

Variable	Source	df	MS	F Value	p
Motivation	Sex	1	6747.78	6.295	.012
	Group	1	54.03	.050	NS
	Interaction	1	1027.92	.959	NS
	Residual	395	1071.92		
Inclusion	Sex	1	156.29	4.740	.028
	Group	1	7.67	.232	NS
	Interaction	1	4.56	.138	NS
	Residual	358	32.96		

		Trmt		Comp		Total	
Variable	Sex	Grp $\bar{X}$	N	Grp $\bar{X}$	N	$\bar{X}$	N
Motivation	M	122.34	141	123.42	69	122.69	210
	F	132.21	136	126.28	53	130.55	189
Inclusion	M	43.89	123	43.46	65	43.74	188
	F	45.48	122	44.58	52	45.21	174

Appendix B5: Summary of Analyses of Variance: Grade 3, Cross Sectional, Achievement Variables

Variable	Source	df	MS	F Value	p
Reading	Sex	1	989.02	4.428	.037
	Group	1	144.52	.647	NS
	Interaction	1	173.79	.778	NS
	Residual	280	223.35		
Language	Sex	1	2289.43	8.970	.003
	Group	1	452.91	1.775	NS
	Interaction	1	14.16	.055	NS
	Residual	268	255.23		
Total Achievement	Sex	1	11345.40	4.923	.026
	Group	1	1219.07	.529	NS
	Interaction	1	429.32	.186	NS
	Residual	265	2325.05		

		Trmt.		Comp.		Total	
Variable	Sex	Grp $\bar{X}$	N	Grp $\bar{X}$	N	$\bar{X}$	N
Reading	M	30.26	111	32.62	34	30.81	145
	F	34.47	112	33.00	27	34.19	139
Language	M	33.32	110	37.89	27	34.22	137
	F	39.74	112	43.13	23	40.32	135
Total Achievement	M	117.30	109	124.92	26	118.77	135
	F	131.63	112	132.64	22	131.79	134

Appendix B6: Summary of Analyses of Variance: Grade 4, Cross Sectional, Achievement Variables

Variable	Source	df	MS	F Value	p
Reading	Sex	1	3109.03	9.413	.002
	Group	1	2040.41	6.178	.013
	Interaction	1	1173.19	3.552	NS
	Residual	366	330.29		
Language	Sex	1	6731.77	21.121	.001
	Group	1	3808.40	11.95	.001
	Interaction	1	931.30	2.92	NS
	Residual	363	318.72		
Arithmetic	Sex	1	2863.30	4.892	.026
	Group	1	2284.93	3.904	.046
	Interaction	1	184.79	.316	NS
	Residual	355	585.26		
Total Achievement	Sex	1	37563.78	12.730	.001
	Group	1	29555.45	10.016	.002
	Interaction	1	12560.13	4.256	.038
	Residual	351	2950.88		
Study Skills	Sex	1	212.89	5.815	.016
	Group	1	419.89	11.468	.001
	Interaction	1	212.98	5.817	.016
	Residual	362	36.61		

Variable	Sex	Trmt Grp $\bar{X}$	N	Comp Grp $\bar{X}$	N	Total $\bar{X}$	N
Reading	M	36.18	111	42.73	83	38.99	194
	F	43.54	119	42.67	57	43.26	176
Language	M	36.85	109	45.84	83	40.74	192
	F	47.73	119	50.07	56	48.48	175
Arithmetic	M	55.90	109	62.96	79	58.87	188
	F	63.05	115	67.13	56	64.39	171
Total Achievement	M	134.52	108	160.06	78	145.23	186
	F	160.54	114	161.27	78	160.78	169
Study Skills	M	13.08	112	16.05	83	14.34	195
	F	15.02	115	14.80	56	14.95	171

Appendix B7: Summary of Analyses of Variance: Grade 5, Cross Sectional, Achievement Variables

Variable	Source	df	MS	F Value	p
Arithmetic	Sex	1	221.97	.933	NS
	Group	1	1883.79	7.069	.024
	Interaction	1	1341.17	5.033	.008
	Residual	380	266.47		
Language	Sex	1	1484.44	6.574	.01
	Group	1	351.69	1.558	NS
	Interaction	1	469.24	2.078	NS
	Residual	372	225.80		

		Trmt		Comp		Total	
Variable	Sex	Grp $\bar{X}$	N	Grp $\bar{X}$	N	$\bar{X}$	N
Arithmetic	M	52.81	119	45.69	54	50.58	173
	F	50.96	143	51.91	68	51.27	211
Language	M	35.46	115	32.33	52	34.49	167
	F	40.29	143	42.00	66	40.83	209

Appendix B8: Summary of Analyses of Variance: Grade 6, Cross Sectional, Achievement Variables

Variable	Source	df	MS	F Value	p
Language	Sex	1	2758.77	10.369	.002
	Group	1	167.34	.629	NS
	Interaction	1	2.67		NS
	Residual	456	266.07		
Total Achievement	Sex	1	8707.48	4.262	.037
	Group	1	15.56	.008	NS
	Interaction	1	241.35	.118	NS
	Residual	431	2042.82		
Study Skills	Sex	1	483.91	5.517	.018
	Group	1	1.20	.014	NS
	Interaction	1	22.98	.262	NS
	Residual	451	87.71		

		Trmt		Comp		Total	
Variable	Sex	Grp $\bar{X}$	N	Grp $\bar{X}$	N	$\bar{X}$	N
Language	M	38.20	124	40.04	83	38.94	207
	F	44.54	154	46.06	99	45.13	252
Total Achievement	M	122.76	117	133.18	77	133.53	194
	F	145.38	144	147.86	97	146.37	241
Study Skills	M	21.47	122	21.63	80	21.53	202
	F	24.14	153	23.37	100	23.83	253

Appendix B9: ANOVA Source Table for Language Achievement by Sex, Group: Grade 7, Cross Sectional

Source	SS	df	MS	F
Sex	377.907	1	377.907	2.215
Group	94.922	1	94.922	.556
Sex x group	1336.361	1	1336.361	7.832*
Residual	44531.414	261	170.618	
Total	48681.508	264	184.400	

Sex	Treatment		Comparison		Total	
	Grp $\bar{X}$	N	Grp $\bar{X}$	N	Grp $\bar{X}$	N
Male	30.00	85	28.08	37	29.42	122
Female	32.86	101	40.79	42	35.19	143

*p=.006

Appendix B10: ANOVA Source Table for Study Skills Achievement by Sex, Group: Grade 7, Cross Sectional

Source	SS	df	MS	F
Sex	36.834	1	36.834	.618
Group	.800	1	.800	.013
Sex x group	316.017	1	316.017	5.304*
Residual	15608.816	262	59.576	
Total	16562.719	265	62.501	

Sex	Treatment		Comparison		Total	
	Grp $\bar{X}$	N	Grp $\bar{X}$	N	Grp $\bar{X}$	N
Male	17.09	120	16.91	34	17.04	120
Female	17.97	107	22.69	39	19.23	146

*p=.021

Appendix B11: Summary of Analyses of Variance: Grade 8, Cross Sectional, Achievement Variables

Variable	Source	df	MS	F Value	p
Language	Sex	1	2607.02	13.278	.001
	Group	1	100.78	.513	NS
	Interaction	1	66.07	.337	NS
	Residual	319	196.34		
Total Achievement	Sex	1	6336.77	3.936	.045
	Group	1	1535.01	.953	
	Interaction	1	576.94	.353	
	Residual	309	1609.91		

		Trmt.		Comp.		Total	
Variable	Sex	Grp $\bar{X}$	N	Grp $\bar{X}$	N	$\bar{X}$	N
Language	M	35.14	118	36.85	48	35.63	166
	F	41.83	115	41.52	42	41.75	157
Total Achievement	M	115.68	114	122.42	48	117.67	162
	F	126.34	109	127.07	42	126.54	151

APPENDIX C

Tables for the Cross Sectional Analyses of the Longitudinal Subsamples

Appendix C1: Summary of Analyses of Variance: Grade 4, Longitudinal Subsample, Inclusion Attitude

Variable	Source	df	MS	F Value	p
Inclusion	Sex	1	16.62	.833	NS
	Group	1	115.31	5.781	.017
	Interaction	1	6.39	.320	NS
	Residual	169	19.94		

		Trmt		Comp		Total	
Variable	Sex	Grp $\bar{X}$	N	Grp $\bar{X}$	N	$\bar{X}$	N
Inclusion	M	44.35	63	41.85	26	43.62	89
	F	45.06	70	43.50	14	44.80	84

Appendix C2: Summary of Analyses of Variance: Grade 5, Longitudinal Subsample, Inclusion Attitude

Variable	Source	df	MS	F Value	p
Inclusion	Sex	1	141.44	4.352	.036
	Group	1	9.81	.302	NS
	Interaction	1	30.97	.953	NS
	Residual	193	32.49		

		Trmt		Comp		Total	
Variable	Sex	Grp $\bar{X}$	N	Grp $\bar{X}$	N	$\bar{X}$	N
Inclusion	M	42.56	73	43.37	19	42.73	92
	F	44.47	83	43.32	22	44.23	105

Appendix C3: Summary of Analyses of Variance: Grade 6, Longitudinal Subsample, Achievement Attitude

Variable	Source	df	MS	F Value	p
Achievement Attitude	Sex	1	289.91	5.751	.017
	Group	1	11.86	.235	NS
	Interaction	1	44.95	.892	NS
	Residual	185	50.41		

		Trmt		Comp		Total	
Variable	Sex	Grp $\bar{X}$	N	Grp $\bar{X}$	N	$\bar{X}$	N
Achievement Attitude	M	53.03	65	52.15	20	52.82	85
	F	50.19	80	51.62	24	50.52	104

Appendix C4: ANOVA Source Table for Motivation by Sex, Group: Grade 8, Longitudinal Subsample

Source	SS	df	MS	F
Sex	558.634	1	558.634	5.317*
Group	98.374	1	98.374	.936
Sex x group	4.089	1	4.089	.039
Residual	8405.855	80	105.073	
Total	9480.918	83		

Sex	Treatment		Comparison		Total	
	Grp $\bar{X}$	N	Grp $\bar{X}$	N	Grp $\bar{X}$	N
Male	124.40	25	120.92	12	123.27	37
Female	130.67	33	128.14	14	129.92	47
Combined	127.97	58				

*p=.023

Appendix C5: Summary of Analyses of Variance: Grade 3, Longitudinal Subsample, Achievement Variables

Variable	Source	df	MS	F Value	p
Reading	Sex	1	887.01	4.354	.036
	Group	1	426.05	2.091	NS
	Interaction	1	352.79	1.732	NS
	Residual	174	203.71		
Language	Sex	1	2476.84	10.782	.001
	Group	1	756.67	3.294	NS
	Interaction	1	61.93	.270	NS
	Residual	166	229.71		
Total Achievement	Sex	1	10853.72	5.193	.023
	Group	1	2339.99	1.120	NS
	Interaction	1	34.55	.017	NS
	Residual	164	2090.09		

Variable	Sex	Trmt Grp $\bar{X}$	N	Comp Grp $\bar{X}$	N	Total $\bar{X}$	N
Reading	M	30.00	67	34.77	26	31.33	93
	F	35.06	72	32.69	13	34.69	85
Language	M	32.39	66	39.29	21	34.06	87
	F	40.88	72	44.55	11	41.36	83
Total Achievement	M	117.23	65	129.60	20	120.14	85
	F	135.06	72	145.00	11	136.37	83

Appendix C6: Summary of Analyses of Variance: Grade 4, Longitudinal Subsample, Achievement Variables

Variable	Source	df	MS	F Value	p
Language	Sex	1	3417.97	11.311	.001
	Group	1	1483.49	4.909	.027
	Interaction	1	129.24	.428	NS
	Residual	163	302.19		
Arithmetic	Sex	1	3530.09	6.071	.014
	Group	1	4943.58	8.502	.004
	Interaction	1	1067.70	1.836	NS
	Residual	155	581.49		
Total Achievement	Sex	1	15259.94	5.287	.022
	Group	1	12812.50	4.439	.035
	Interaction	1	3201.01	1.109	NS
	Residual	156	2886.15		
Study Skills	Sex	1	61.70	1.868	NS
	Group	1	172.15	5.212	.023
	Interaction	1	76.32	2.311	NS
	Residual	158	33.03		

		Trmt		Comp		Total	
Variable	Sex	Grp $\bar{X}$	N	Grp $\bar{X}$	N	$\bar{X}$	N
Language	M	38.78	59	47.85	26	41.55	85
	F	49.29	65	54.07	14	50.14	79
Arithmetic	M	54.54	59	71.83	23	59.39	82
	F	65.27	64	69.77	13	66.03	77
Total Achievement	M	141.22	59	168.63	24	149.15	83
	F	163.52	64	168.92	13	164.43	77
Study Skills	M	13.92	60	17.04	25	14.84	85
	F	15.33	64	15.08	13	15.29	77

Appendix C7: Summary of Analyses of Variance: Grade 6, Longitudinal Subsample, Achievement Variables

Variable	Source	df	MS	F Value	p
Arithmetic	Sex	1	32.08	.104	NS
	Group	1	1223.96	3.954	.045
	Interaction	1	1771.25	5.725	.017
	Residual	198	309.39		

		Trmt		Comp		Total	
Variable	Sex	Grp $\bar{X}$	N	Grp $\bar{X}$	N	$\bar{X}$	N
Arithmetic	M	58.73	71	49.50	18	56.87	89
	F	57.44	90	63.44	23	58.97	113

APPENDIX D

Tables for the Repeated Measures Analyses of the Longitudinal Subsamples

APPENDIX D1: Repeated Measures ANOVA Table, Cohort I: Self Concept

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	1.59	1	1.59	0.10	ns
Sex	18.62	1	18.62	1.17	ns
Grp x Sex	45.79	1	45.79	2.88	ns
Error	2894.14	182	15.90		
WITHIN SUBJECTS					
Year	33807.40	3	11290.13	1292.94	.001
Yr x Grp	13.44	3	4.48	0.51	ns
Yr x Sex	50.92	3	16.97	1.94	ns
Yr x Grp x Sex	33.12	3	11.04	1.26	ns
Error	4767.75	546	8.73		

Sex	T_1 $\bar{X}$	T_1 sd	T_2 $\bar{X}$	T_2 sd	T_3 $\bar{X}$	T_3 sd	T_4 $\bar{X}$	T_4 sd	N
Treatment									
Males	45	3	45	2	44	2	65	4	69
Females	45	3	45	3	45	2	65	4	75
Combined	45		45		44		65		144
Comparison									
Males	46	2	45	3	45	2	66	5	28
Females	44	3	46	3	44	2	63	5	14
Combined	45		45		45		65		42

APPENDIX D2: Repeated Measures ANOVA Table, Cohort I: Motivation

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	9.61	1	9.61	0.72	ns
Sex	8.34	1	8.34	0.63	ns
Grp x Sex	12.73	1	12.73	0.96	ns
Error	2422.50	182	13.31		
WITHIN SUBJECTS					
Year	42945.21	3	14315.07	1991.82	.001
Yr x Grp	21.88	3	7.29	1.01	ns
Yr x Sex	11.55	3	3.85	0.53	ns
Yr x Grp x Sex	93.49	3	31.16	4.33	.01
Error	3924.05	546	7.19		

Sex	T_1 $\bar{X}$	T_1 sd	T_2 $\bar{X}$	T_2 sd	T_3 $\bar{X}$	T_3 sd	T_4 $\bar{X}$	T_4 sd	N
Treatment									
Males	44	2	44	2	44	2	65	5	69
Females	43	3	44	2	45	2	67	4	75
Combined	44		44		45		66		144
Comparison									
Males	43	2	45	2	44	2	67	3	28
Females	43	2	45	2	44	2	66	3	14
Combined	43		45		44		67		42

APPENDIX D3: Repeated Measures ANOVA Table, Cohort II: Self Concept

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	135.04	1	135.04	1.80	ns
Sex	171.22	1	171.22	2.29	ns
Grp x Sex	54.70	1	54.70	0.73	ns
Error	11377.20	52	74.85		
WITHIN SUBJECTS					
Year	13785.94	3	4595.31	176.11	.001
Yr x Grp	340.64	3	113.55	4.35	.01
Yr x Sex	156.47	3	52.16	2.00	ns
Yr x Grp x Sex	38.07	3	12.69	0.49	ns
Error	11898.55	456	26.09		

	T_1		T_2		T_3		T_4		
Sex	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	N
				Treatment					
Males	44	5	43	6	58	7	55	7	57
Females	44	5	43	5	57	7	53	6	73
Combined	44		43		57		54		130
				Comparison					
Males	45	6	44	5	58	4	61	8	12
Females	44	4	44	5	55	7	56	5	14
Combined	44		44		56		58		26

APPENDIX D4: Repeated Measures ANOVA Table, Cohort II: Motivation

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	10.77	1	10.77	0.20	ns
Sex	165.27	1	165.27	3.02	ns
Grp x Sex	4.31	1	4.31	0.07	ns
Error	8309.36	152	54.67		
WITHIN SUBJECTS					
Year	14337.10	3	4779.04	265.29	.001
Yr x Grp	200.12	3	66.71	3.70	.02
Yr x Sex	40.38	3	13.46	0.75	ns
Yr x Grp x Sex	34.51	3	11.50	0.64	ns
Error	8214.46	456	18.01		

	T_1		T_2		T_3		T_4		
Sex	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	N
				Treatment					
Males	44	4	43	4	56	6	55	6	57
Females	46	4	44	4	57	7	57	6	73
Combined	45		44		57		56		130
				Comparison					
Males	43	5	42	2	54	4	57	7	12
Females	43	3	43	5	57	5	59	4	14
Combined	43		42		56		58		26

APPENDIX D5: Repeated Measures ANOVA Table, Cohort II: Achievement Attitude

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	4.62	1	4.62	0.05	ns
Sex	0.11	1	0.11	0.00	ns
Grp x Sex	2.54	1	2.54	0.03	ns
Error	738.77	86	85.87		
WITHIN SUBJECTS					
Year	742.62	3	247.54	7.94	.001
Yr x Grp	98.27	3	32.76	1.05	ns
Yr x Sex	313.43	3	104.48	3.35	.02
Yr x Grp x Sex	14.86	3	4.95	0.16	ns
Error	8043.68	258	31.18		

Sex	T_1		T_2		T_3		T_4		N
	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	
Treatment									
Males	53	6	54	6	48	6	51	8	34
Females	52	7	51	6	49	7	54	7	41
Combined	52		52		48		53		75
Comparison									
Males	52	8	56	8	47	7	49	7	6
Females	50	7	53	5	49	6	53	6	9
Combined	51		54		48		51		15

APPENDIX D6: Repeated Measures ANOVA Table, Cohort II: Affiliation Attitude

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	6.34	1	6.34	0.09	ns
Sex	31.78	1	31.78	0.47	ns
Grp x Sex	1.71	1	1.71	0.02	ns
Error	5792.56	86	67.36		
WITHIN SUBJECTS					
Year	1282.27	3	427.42	16.08	.001
Yr x Grp	43.14	3	14.38	0.54	ns
Yr x Sex	39.21	3	13.07	0.49	ns
Yr x Grp x Sex	149.52	3	49.84	1.87	ns
Error	6859.97	258	26.59		

Sex	T_1		T_2		T_3		T_4		N
	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	
Treatment									
Males	50	6	52	7	49	6	46	6	34
Females	50	6	50	7	49	5	45	5	41
Combined	50		51		49		45		75
Comparison									
Males	51	11	50	6	50	4	44	4	6
Females	49	6	54	6	46	1	43	6	9
Combined	50		52		48		43		15

APPENDIX D7: Repeated Measures ANOVA Table, Cohort II: Inclusion Attitude

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	126.83	1	126.83	2.15	ns
Sex	181.74	1	181.74	3.08	ns
Grp x Sex	24.46	1	24.46	0.42	ns
Error	5065.65	86	58.90		
WITHIN SUBJECTS					
Year	451.78	3	150.59	6.18	.001
Yr x Grp	58.43	3	19.48	0.80	ns
Yr x Sex	41.58	3	13.86	0.57	ns
Yr x Grp x Sex	57.45	3	19.15	0.78	ns
Error	6287.58	258	24.37		

	T_1		T_2		T_3		T_4		
Sex	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	N
Treatment									
Males	43	6	49	9	49	6	48	5	34
Females	46	5	49	4	50	6	48	5	41
Combined	45		49		50		48		75
Comparison									
Males	43	4	44	4	44	3	47	5	6
Females	45	6	49	5	48	5	48	1	9
Combined	44		47		46		48		15

APPENDIX D8: Repeated Measures ANOVA Table, Cohort III: Self Concept

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	13.68	1	13.68	0.14	ns
Sex	1.20	1	1.20	0.01	ns
Grp x Sex	12.68	1	12.68	0.13	ns
Error	7918.76	80	98.98		
WITHIN SUBJECTS					
Year	12.13	2	6.07	0.19	ns
Yr x Grp	11.26	2	5.63	0.18	ns
Yr x Sex	74.62	2	37.31	1.18	ns
Yr x Grp x Sex	29.15	2	14.58	0.46	ns
Error	5073.48	160	31.71		

	T_1		T_2		T_3		T_4		
Sex	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	N
Treatment									
Males	50	5	49	9	50	8			25
Females	51	8	50	8	50	7	na		33
Combined	51		50		50				58
Comparison									
Males	50	8	49	7	52	8			12
Females	50	8	50	5	49	6	na		14
Combined	50		50		50				26

APPENDIX D9: Repeated Measures ANOVA Table, Cohort III: Motivation

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	66.20	1	66.20	1.13	ns
Sex	469.12	1	469.12	8.02	.01
Grp x Sex	35.79	1	35.79	0.61	ns
Error	4679.02	80	58.49		
WITHIN SUBJECTS					
Year	68.78	2	34.39	1.59	ns
Yr x Grp	3.60	2	1.80	0.08	ns
Yr x Sex	1.73	2	0.86	0.04	ns
Yr x Grp x Sex	36.31	2	18.16	0.84	ns
Error	3454.29	160	21.59		

	T_1		T_2		T_3		T_4		
Sex	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	N
Treatment									
Males	49	6	49	5	50	5			25
Females	52	4	50	9	52	5	na		33
Combined	51		50		51				58
Comparison									
Males	48	6	46	5	48	6			12
Females	51	4	51	6	51	5	na		14
Combined	50		49		50				26

APPENDIX D10: Repeated Measures ANOVA Table, Cohort III: Achievement Attitude

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	53.71	1	53.71	0.66	ns
Sex	93.43	1	93.43	1.14	ns
Grp x Sex	18.96	1	18.96	0.23	ns
Error	4730.79	58	81.56		
WITHIN SUBJECTS					
Year	11.57	2	5.79	0.18	ns
Yr x Grp	39.35	2	19.67	0.63	ns
Yr x Sex	68.27	2	34.14	1.09	ns
Yr x Grp x Sex	149.90	2	74.95	2.39	ns
Error	3630.75	116	31.30		

	T_1		T_2		T_3		T_4		
Sex	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	N
Treatment									
Males	48	8	48	6	47	7			20
Females	47	6	44	8	49	7	na		22
Combined	47		46		48				42
Comparison									
Males	46	5	48	7	48	10			10
Females	47	4	45	8	43	5	na		10
Combined	46		46		46				20

APPENDIX D11: Repeated Measures ANOVA Table, Cohort III: Affiliation Attitude

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	25.36	1	25.36	0.34	ns
Sex	52.80	1	52.80	0.71	ns
Grp x Sex	2.34	1	2.34	0.03	ns
Error	7304.12	58	74.21		
WITHIN SUBJECTS					
Year	149.71	2	74.86	3.03	ns
Yr x Grp	15.77	2	7.87	0.32	ns
Yr x Sex	123.39	2	64.20	2.60	ns
Yr x Grp x Sex	186.34	2	93.17	3.77	
Error	2867.41	116	24.72		

	T_1		T_2		T_3		T_4		
Sex	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	N
Treatment									
Males	46	7	47	6	48	6			20
Females	44	6	45	7	47	6	na		22
Combined	45		46		48				42
Comparison									
Males	45	7	46	5	51	8			10
Females	47	7	48	7	44	5	na		10
Combined	46		47		48				20

APPENDIX D12: Repeated Measures ANOVA Table, Cohort III: Inclusion Attitude

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	25.07	1	25.07	0.60	ns
Sex	13.14	1	13.14	0.31	ns
Grp x Sex	1.59	1	1.59	0.04	ns
Error	2421.11	58	41.74		
WITHIN SUBJECTS					
Year	176.60	2	88.30	4.28	.02
Yr x Grp	17.32	2	8.66	0.42	ns
Yr x Sex	48.71	2	24.35	1.18	ns
Yr x Grp x Sex	125.04	2	62.52	3.03	ns
Error	2390.91	116	20.61		

	T_1		T_2		T_3		T_4		
Sex	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	N
Treatment									
Males	47	6	50	5	49	6			20
Females	47	6	50	4	50	5	na		22
Combined	47		50		50				42
Comparison									
Males	46	6	46	6	50	5			10
Females	47	6	50	4	47	5	na		10
Combined	46		48		48				20

APPENDIX D13: Repeated Measures ANOVA Table, Cohort I: Language

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	876.50	1	876.50	6.27	.02
Sex	571.98	1	571.98	4.09	.05
Grp x Sex	2.55	1	2.55	0.01	ns
Error	17203.68	123	139.87		
WITHIN SUBJECTS					
Year	16698.39	3	5566.13	213.52	.001
Yr x Grp	447.59	3	149.20	5.72	.001
Yr x Sex	409.84	3	136.61	5.24	.001
Yr x Grp x Sex	8.58	3	2.86	0.11	ns
Error	9619.08	369	26.07		

	T_1		T_2		T_3		T_4		
Sex	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	N
Treatment									
Males	42	2	44	5	52	9	55	10	45
Females	42	3	45	7	55	10	61	10	55
Combined	42		44		54		58		100
Comparison									
Males	42	3	48	5	54	9	61	10	18
Females	42	4	49	6	59	6	67	6	9
Combined	42		48		56		63		27

APPENDIX D14: Repeated Measures ANOVA Table, Cohort I: Reading Achievement

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	251.49	1	251.49	1.85	ns
Sex	171.56	1	171.56	1.26	ns
Grp x Sex	3.93	1	3.93	0.02	ns
Error	19303.07	142	135.94		
WITHIN SUBJECTS					
Year	5948.46	2	2974.23	121.77	.001
Yr x Grp	32.28	2	16.14	0.66	ns
Yr x Sex	12.68	2	6.34	0.26	ns
Yr x Grp x Sex	62.57	2	31.29	1.28	ns
Error	6936.69	284	24.42		

	T_1		T_2		T_3		T_4		
Sex	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	N
Treatment									
Males			46	4	51	8	56	10	53
Females	na		46	5	53	9	58	9	59
Combined			46		52		57		112
Comparison									
Males			47	4	53	8	58	10	23
Females	na		49	6	53	9	60	9	11
Combined			48		53		59		34

APPENDIX D15: Repeated Measures ANOVA Table, Cohort I: Arithmetic Achievement

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	0.43	1	0.43	0.00	ns
Sex	179.05	1	179.05	1.94	ns
Grp x Sex	99.84	1	99.84	1.08	ns
Error	6823.51	74	92.21		
WITHIN SUBJECTS					
Year	11656.84	3	3885.61	90.07	.001
Yr x Grp	211.93	3	70.64	1.64	ns
Yr x Sex	189.80	3	63.27	1.47	ns
Yr x Grp x Sex	122.20	3	40.73	0.94	ns
Error	9576.92	222	43.14		

Sex	T_1 $\bar{X}$	T_1 sd	T_2 $\bar{X}$	T_2 sd	T_3 $\bar{X}$	T_3 sd	T_4 $\bar{X}$	T_4 sd	N
Treatment									
Males	39		46		57		55		33
Females	39		46		56		58		27
Combined	39		46		57		56		60
Comparison									
Males	38		46		50		57		12
Females	39		46		58		62		6
Combined	38		46		53		59		18

APPENDIX D16: Repeated Measures ANOVA Table, Cohort I: Total Achievement

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	549.95	1	549.95	3.87	ns
Sex	306.83	1	306.83	2.16	ns
Grp x Sex	9.13	1	9.13	0.06	ns
Error	16635.23	117	142.18		
WITHIN SUBJECTS					
Year	9193.41	2	4596.70	226.87	.001
Yr x Grp	91.73	2	45.87	2.26	ns
Yr x Sex	50.91	2	25.46	1.26	ns
Yr x Grp x Sex	10.15	2	5.08	0.25	ns
Error	4741.18	234	20.26		

Sex	T_1 $\bar{X}$	T_1 sd	T_2 $\bar{X}$	T_2 sd	T_3 $\bar{X}$	T_3 sd	T_4 $\bar{X}$	T_4 sd	N
Treatment									
Males			42	5	50	9	55	11	45
Females	na		42	5	53	8	58	9	51
Combined			42		52		57		96
Comparison									
Males			44	4	51	7	60	8	16
Females	na		45	5	55	7	63	8	9
Combined			44		52		61		25

APPENDIX D17: Repeated Measures ANOVA Table, Cohort I: Study Skills Achievement

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	386.86	1	386.86	2.18	ns
Sex	136.17	1	136.17	0.77	ns
Grp x Sex	27.08	1	27.08	0.15	ns
Error	22312.61	126	177.08		
WITHIN SUBJECTS					
Year	8092.15	2	114.93	83.24	.001
Yr x Grp	229.87	2	21.36	2.36	ns
Yr x Sex	42.72	2	61.76	0.44	ns
Yr x Grp x Sex	123.53	2	48.60	1.27	ns
Error	12248.79	252			

	T_1		T_2		T_3		T_4		
Sex	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	N
Treatment									
Males			44	6	50	9	55	12	45
Females	na		44	8	51	10	57	11	54
Combined			44		51		56		99
Comparison									
Males			42	6	53	9	60	10	21
Females	na		45	9	57	10	59	10	10
Combined			43		54		60		31

APPENDIX D18: Repeated Measures ANOVA Table, Cohort II: Language Achievement

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	19.46	1	19.46	0.06	ns
Sex	925.85	1	925.85	3.05	ns
Grp x Sex	53.00	1	53.00	0.17	ns
Error	24269.77	80	303.37		
WITHIN SUBJECTS					
Year	2381.00	3	793.67	35.18	.001
Yr x Grp	159.41	3	53.14	2.36	ns
Yr x Sex	16.94	3	5.65	0.25	ns
Yr x Grp x Sex	62.10	3	26.70	0.92	ns
Error	5413.69	240	22.56		

	T_1		T_2		T_3		T_4		
Sex	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	N
Treatment									
Males	50	9	54	11	46	10	47	8	27
Females	52	11	57	11	48	8	52	10	38
Combined	51		56		47		50		65
Comparison									
Males	47	10	53	11	42	8	50	10	10
Females	51	8	58	8	49	8	54	6	9
Combined	49		55		45		52		19

APPENDIX D19: Repeated Measures ANOVA Table, Cohort II: Reading Achievement

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	142.25	1	142.25	0.51	ns
Sex	5.87	1	5.87	0.02	ns
Grp x Sex	33.06	1	33.06	0.12	ns
Error	22155.15	80	276.94		
WITHIN SUBJECTS					
Year	2474.85	3	824.95	40.06	.001
Yr x Grp	94.49	3	31.50	1.53	ns
Yr x Sex	12.32	3	4.10	0.20	ns
Yr x Grp x Sex	77.60	3	25.87	1.26	ns
Error	4942.51	240	20.59		

	T_1		T_2		T_3		T_4		
Sex	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	N
				Treatment					
Males	52	10	55	10	48	9	50	9	27
Females	51	9	56	10	48	8	52	10	37
Combined	51		56		48		51		64
				Comparison					
Males	49	10	56	11	46	10	50	11	10
Females	50	5	56	7	44	4	48	6	10
Combined	50		56		45		49		20

APPENDIX D20: Repeated Measures ANOVA Table, Cohort II: Arithmetic Achievement

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	403.72	1	403.72	1.88	ns
Sex	0.04	1	0.04	0.00	ns
Grp x Sex	7.33	1	7.33	0.03	ns
Error	17853.00	83	215.10		
WITHIN SUBJECTS					
Year	5137.58	3	1712.53	63.12	.001
Yr x Grp	92.12	3	20.71	1.13	ns
Yr x Sex	179.32	3	59.77	2.20	ns
Yr x Grp x Sex	144.94	3	48.31	1.78	ns
Error	6756.08	249	27.13		

	T_1		T_2		T_3		T_4		
Sex	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	N
				Treatment					
Males	54	9	57	11	45	7	48	9	29
Females	52	10	58	9	45	7	48	9	37
Combined	53		58		45		48		66
				Comparison					
Males	49	10	52	8	43	4	49	10	10
Females	51	5	56	9	42	4	46	5	11
Combined	50		54		42		47		21

APPENDIX D21: Repeated Measures ANOVA Table, Cohort II: Total Achievement

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	197.84	1	197.84	0.60	ns
Sex	169.00	1	169.00	0.51	ns
Grp x Sex	2.11	1	2.11	0.00	ns
Error	24315.84	74	328.59		
WITHIN SUBJECTS					
Year	4006.00	3	1335.23	78.56	.001
Yr x Grp	83.35	3	27.78	1.63	ns
Yr x Sex	11.58	3	3.86	0.22	ns
Yr x Grp x Sex	78.87	3	26.29	1.55	ns
Error	3773.44	222	17.00		

	T_1		T_2		T_3		T_4		
Sex	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	N
Treatment									
Males	52	10	56	10	45	8	48	9	25
Females	52	11	58	11	46	8	51	11	34
Combined	52		57		46		50		59
Comparison									
Males	48	11	54	11	42	8	49	11	10
Females	56	6	57	9	44	5	49	6	9
Combined	49		55		43		49		19

APPENDIX D22: Repeated Measures ANOVA Table, Cohort II: Study Skills Achievement

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	0.27	1	0.27	0.00	ns
Sex	172.16	1	172.16	0.64	ns
Grp x Sex	2.28	1	2.28	0.00	ns
Error	21499.29	80			
WITHIN SUBJECTS					
Year	2589.96	3	863.32	30.15	.001
Yr x Grp	203.67	3	67.89	2.37	ns
Yr x Sex	121.47	3	40.49	1.41	ns
Yr x Grp x Sex	84.30	3	28.10	0.98	ns
Error	6872.76	240	28.64		

	T_1		T_2		T_3		T_4		
Sex	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	N
Treatment									
Males	50	8	54	12	45	8	50	9	27
Females	49	9	57	11	47	8	52	10	36
Combined	49		56		46		51		63
Comparison									
Males	46	6	54	11	44	7	53	10	10
Females	48	7	55	10	50	8	53	8	11
Combined	47		54		47		53		21

APPENDIX D23: Repeated Measures ANOVA Table, Cohort III: Language Achievement

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	46.95	1	46.95	0.26	ns
Sex	651.79	1	651.79	3.66	ns
Grp x Sex	117.63	1	117.63	0.66	ns
Error	11027.57	62	177.86		
WITHIN SUBJECTS					
Year	153.68	2	76.84	3.54	.04
Yr x Grp	21.81	2	10.90	0.50	ns
Yr x Sex	12.46	2	6.23	0.29	ns
Yr x Grp x Sex	24.49	2	12.24	0.56	ns
Error	2693.89	124	21.72		

	T_1		T_2		T_3		T_4		
Sex	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	N
Treatment									
Males	49	10	48	7	49	8			21
Females	52	8	50	6	51	11	na		22
Combined	50		49		50				43
Comparison									
Males	50	9	46	9	48	8			11
Females	55	11	53	8	53	9	na		12
Combined	53		50		51				23

APPENDIX D24: Repeated Measures ANOVA Table, Cohort III: Reading Achievement

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	12.07	1	12.07	0.81	ns
Sex	6.55	1	6.55	0.86	ns
Grp x Sex	52.36	1	52.36	0.61	ns
Error	12596.17	62	203.16		
WITHIN SUBJECTS					
Year	722.32	2	361.16	15.39	.001
Yr x Grp	35.35	2	17.68	0.75	ns
Yr x Sex	13.90	2	6.95	0.30	ns
Yr x Grp x Sex	19.66	2	9.83	0.42	ns
Error	2910.07	124	23.47		

	T_1		T_2		T_3		T_4		
Sex	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	N
Treatment									
Males	52	10	48	7	52	7			21
Females	52	8	47	6	51	11	na		22
Combined	52		48		52				43
Comparison									
Males	53	10	48	9	50	10			11
Females	54	10	49	10	52	11	na		12
Combined	54		48		51				23

APPENDIX D25: Repeated Measures ANOVA Table, Cohort III: Arithmetic Achievement

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	55.80	1	55.80	0.25	ns
Sex	69.69	1	69.69	0.31	ns
Grp x Sex	0.29	1	0.29	0.00	ns
Error	13745.14	61	225.33		
WITHIN SUBJECTS					
Year	1289.07	2	644.53	20.96	.001
Yr x Grp	289.08	2	144.54	4.70	.02
Yr x Sex	127.19	2	63.60	2.07	ns
Yr x Grp x Sex	17.96	2	8.98	0.29	ns
Error	3750.55	122	30.74		

	T_1		T_2		T_3		T_4		
Sex	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	N
Treatment									
Males	51	13	49	8	51	11			21
Females	52	7	47	6	48	9	na		22
Combined	52		48		50				43
Comparison									
Males	56	11	49	12	48	12			11
Females	57	10	46	8	49	11	na		11
Combined	56		48		48				22

APPENDIX D26: Repeated Measures ANOVA Table, Cohort III: Total Achievement

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	81.16	1	81.16	0.31	ns
Sex	43.27	1	43.27	0.16	ns
Grp x Sex	118.73	1	118.73	0.45	ns
Error	15565.71	59	263.82		
WITHIN SUBJECTS					
Year	1149.48	2	574.74	25.29	.001
Yr x Grp	98.71	2	49.36	2.17	ns
Yr x Sex	16.22	2	8.11	0.36	ns
Yr x Grp x Sex	8.51	2	4.25	0.19	ns
Error	2681.22	118	22.72		

	T_1		T_2		T_3		T_4		
Sex	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	N
Treatment									
Males	52	11	48	7	50	10			21
Females	52	8	46	6	49	12	na		20
Combined	52		47		50				41
Comparison									
Males	54	12	47	11	48	11			11
Females	57	11	48	11	51	12	na		11
Combined	56		48		50				22

APPENDIX D27: Repeated Measures ANOVA Table, Cohort III: Study Skills Achievement

Source	SS	df	MSV	F	p
BETWEEN SUBJECTS					
Group	70.48	1	70.48	0.57	ns
Sex	0.20	1	0.20	0.00	ns
Grp x Sex	80.66	1	80.66	0.65	ns
Error	7221.12	58	124.50		
WITHIN SUBJECTS					
Year	262.33	2	131.17	4.47	.02
Yr x Grp	92.92	2	46.46	1.58	ns
Yr x Sex	39.75	2	19.88	0.68	ns
Yr x Grp x Sex	8.12	2	4.06	0.14	ns
Error	3406.35	116	29.36		

	T_1		T_2		T_3		T_4		
Sex	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	N
Treatment									
Males	53	8	50	7	53	6			19
Females	52	8	48	6	53	11	na		22
Combined	52		49		53				41
Comparison									
Males	52	10	49	6	48	6			10
Females	53	7	49	7	51	8	na		11
Combined	52		49		50				21